

EXHIBITION MDCCC.LI
REPORTS BY THE
JURIES





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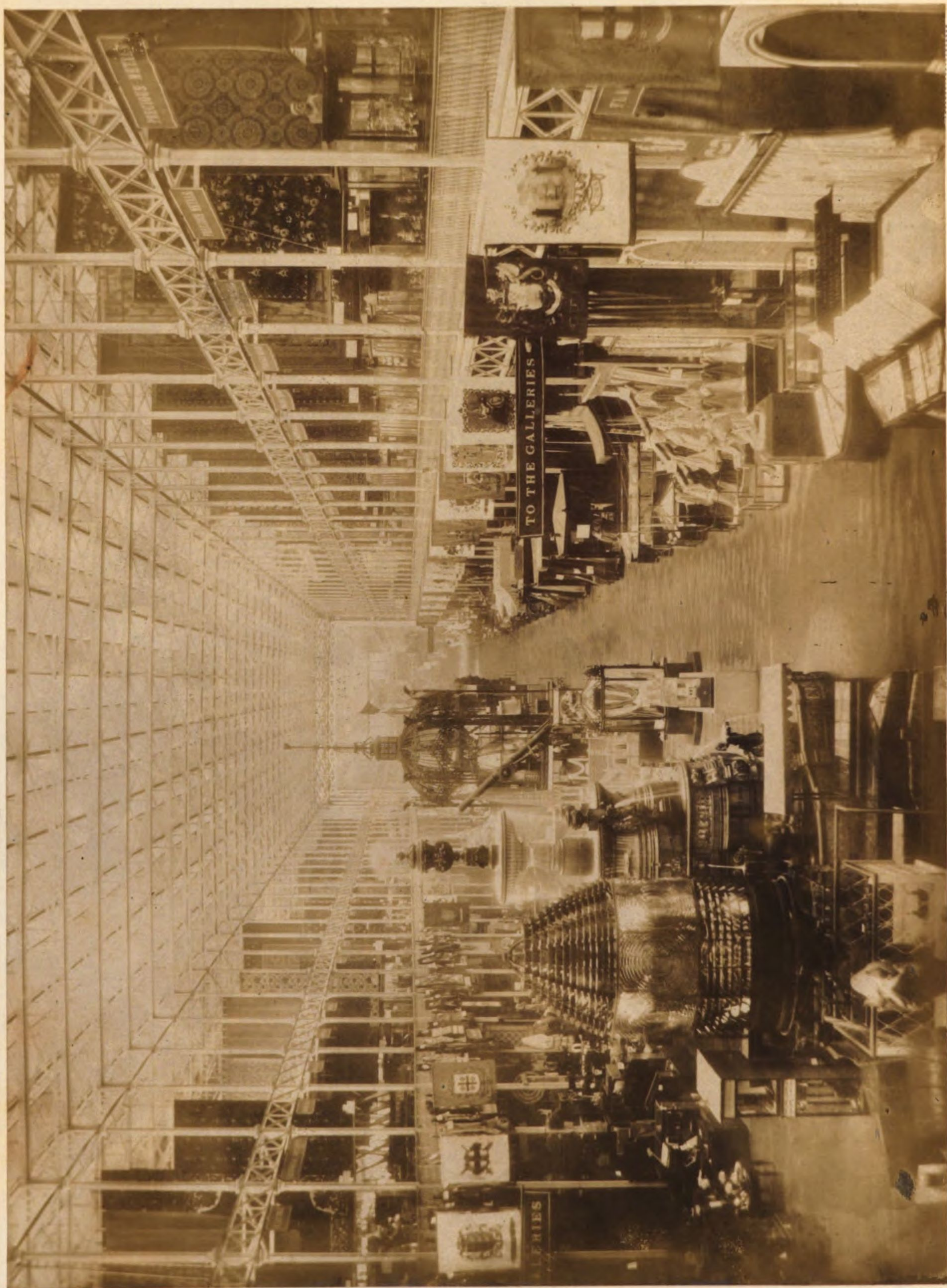
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EXHIBITION OF M.D.C.C.L.I.
TO THE GOVERNMENT
OF JAPAN



VIEW OF WESTERN NAVE.

Exhibition of the Works of Industry of All Nations,
1851.

REPORTS

BY

T H E J U R I E S

ON

THE SUBJECTS IN THE THIRTY CLASSES INTO WHICH
THE EXHIBITION WAS DIVIDED.

By Authority
of the



Royal
Commission.

IN FOUR VOLUMES.

VOL. IV.

REPORTS—CLASSES XXIX., XXX.

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BRONZE FIGURES.

CHINA.

CLASS XXIX.

REPORT ON MISCELLANEOUS MANUFACTURES AND SMALL WARES.

Jury.

VISCOUNT CANNING, *Chairman*, 10 Grosvenor Square.

— WOŁOWSKI, *Deputy Chairman*, France ; Professor to the Conservatory of Arts and Manufactures, Member of the Central Jury and of the Legislative Assembly of France.

WARREN DE LA RUE, Ph. D., F.R.S., F.R.A.S., F.C.S., &c., *Reporter*, 110 Bunhill Row, Finsbury, and 7 St. Mary's Road, Canonbury, Islington ; Manufacturer of Ornamental Stationery.

A. W. HOFMANN, Ph. D., F.R.S., F.C.S., Corresponding Member of the Royal Academy of Turin, of the Philomathic Society of Paris, &c., *Joint Reporter*, Zollverein, 26 Albany Street, Regent's Park ; Professor of Chemistry, Royal College of Chemistry.

ARTHUR HENFREY, F.L.S., 17 Manchester Street, Gray's Inn Road ; Vice-President of the Botanical Society.

JOHN JOSEPH MECI, 4 Leadenhall Street ; Maker of Dressing-cases and Cutlery.

OTTO SCHUMANN, Austria ; Member of the Council of Commerce, Vienna.

W. K. SMITH, Virginia, United States ; Mineralogist.

Associates.

D. W. MITCHELL, 11 Hanover Square ; Secretary to the Zoological Society.

RICHARD OWEN, F.R.S. (Juror Class IV.), Professor to the College of Surgeons, Lincoln's Inn Fields ; President of the College of Surgeons.

NATALIS RONDOT, France (Juror Class XXVI.), late of the Embassy to China, Member of the Central Jury ; Delegate of the Chambers of Commerce of Lyons and Paris.

Members of other Juries, who by request attended some of the Meetings of the Jury, and furnished information on the Chemical Arts.

M. BALARD, France (Juror Class XXVIII.), Member of the Institute, Professor of Chemistry at the College of France, &c. &c.

A. PAYEN, France (Juror Class IV.), Member of the Institute, Member of the Central Jury ; Professor to the Central School, and to the Conservatory of Arts and Manufactures, at Paris.

THE number of Exhibitors of all nations in this Class is Seven hundred and forty-two.

According to the list furnished under the title of Head Juries, this Class was intended to comprise the following articles :—

A. Perfumery and Soap.

B. Articles for Personal Use, as Writing-desks, Dressing-cases, Workboxes, when not exhibited in connexion with precious metals (XXIII.), and Travelling-gear generally.

- C. Artificial Flowers.
- D. Candles and other means of giving Light.
- E. Confectionary of all kinds.
- F. Beads and Toys, when not of hardware ; Fans, &c.
- G. Umbrellas, Parasols, Walking-sticks, &c.
- H. Fishing-tackle of all kinds, Archery, &c.
- I. Games of all kinds.
- J. Other Miscellaneous manufactures.

The latter title is very comprehensive, and might have been made to include all objects not specially enumerated in the lists of other classes. Practically, however, little difficulty was experienced in arranging with the Juries of other classes for their adjudication of those manufactures with which they were most conversant: consequently to the above list there will have to be added only Artificial Essences, Blacking, Lucifer-Matches, Artificial Ivory, Taxidermy, Ethnographical Models, Educational Models, Pipes and Amber-manufactures, and Snuff-boxes. Candles were the only means of giving light brought before the notice of this Jury; and of beads, those of amber only were taken into their consideration. The term Miscellaneous, nevertheless, was retained, in order to enable the Jury to review a few objects not admitting of classification under the preceding heads.

The English Jurors held a preliminary meeting on the 13th of May 1851, and on the 17th, the foreign Jurors having been appointed, the full Jury assembled and elected their Deputy Chairman and Reporters. From this date until the 23rd of July, inclusive, the Jury continued their meetings for the most part three times a week, and having, on the latter day, sent in their final List of Awards, they adjourned.

Owing to the very various character of the manufactures brought before the notice of the Jury, it was quite evident, as its members could not be equally conversant with all, that it would be expedient to divide the Jury into Sub-committees, of which Four were formed, whose duty it was to make a preliminary examination of certain allied classes of manufacture, and to report thereon before the discussion of the Awards took place. In those preliminary examinations the Committees availed themselves freely of their privilege of calling in the aid of persons more intimately acquainted than themselves with the technical merits of particular branches of art.

It was likewise the duty of the Committees to make a list of objects belonging to their various sections; a labour attended with no little difficulty on account of the necessarily imperfect state of the Catalogue at that time, and also from the classification, which was adopted in the British department, being impossible in the colonial and foreign sections. Even in the British section, Class XXIX. did not include all the articles ultimately submitted to the judgment of the Jury, and the Committees had often to search for them in other Classes.

The examination of the goods was usually commenced before eight o'clock in the morning, and continued for six or eight hours during each day, the earlier hours being occupied by the entire Jury in visiting the various stands and discussing the Awards; whilst soon after the admission of the public the Jury, for convenience, again divided into Committees. It is quite possible that with all the care

bestowed on the search for objects belonging to Class XXIX., some articles may have escaped notice; yet the fact of the same Exhibitor having been rewarded by more than one Jury, elicited on comparison of the Award-books at the close of our labours, amply testifies the anxiety on the part of the Jurors generally not to pass any object of merit, even though they might feel doubtful as to its belonging to their respective classes.

In recommending subjects for the award of the Council Medal, the Jury of Class XXIX. adhered strictly to the spirit of the instructions of the Council of Chairmen, and of the explanation given in the "Minute of the Royal Commission on the award of the Council Medal," and in no case have they made any application for its grant, except for *a new and useful invention in important arts*. The recommendations were Three in number, namely, in favour of:—L. A. DE MILLY, France, No. 644, for the invention of practical methods of using lime in the manufacture of stearic candles, and the use of boracic acid in the preparation of their wicks; PRICE'S CANDLE COMPANY, Class IV., No. 83, for the invention of improved methods of treating and distilling fatty bodies, and the application of the products obtained thereby to the manufacture of candles; J. MARQUES CONSTANTIN, France, No. 94, and Portugal, No. 1299, for the invention of an elastic dressing to the materials used in the manufacture of artificial flowers, whereby they are not permanently injured if crumpled in packing, but regain their form on being slightly shaken; also for the adaptation of textile fabrics to the imitation of flowers for botanical museums. These recommendations were unanimously confirmed by the Group E of Juries; but the Council of Chairmen, whilst confirming the award of the Council Medal to L. A. De Milly and J. M. Constantin, negatived that in favour of Price's Candle Company. The Jury feeling that they had not made the recommendation until after a laborious investigation on the part of the Chemical Committee, Messrs. De La Rue, Hofmann, and Smith, and after ample discussion on their parts, protested on the 23rd of July against the decision of the Council of Chairmen in the following terms:—

"The Jury of Class XXIX. unanimously and respectfully protest against the decision which the Council of Chairmen have come to respecting the recommendation of a Great Medal for Price and Company; and feeling that their decision is based upon insufficient information regarding the merits of the case, they hope that the Council of Chairmen will not refuse to reconsider the matter."

In consequence of this protest, the Chemical Committee were invited to attend the meeting of the Council of Chairmen; two of their number, the Reporters, did so, and fully explained the grounds on which the recommendation had been made; but (as they were informed) it was subsequently found, on reference to the minutes of a preceding meeting, that in consequence of a decision with regard to awards generally which had once been taken into consideration, the protest could not be entertained by the Council of Chairmen. The Reporters, however, cannot but regret that there should have existed any impediment to the correction of a decision which, from a careful scrutiny of the merits of the case, they consider erroneous.

The Prize Medal has been awarded for excellence of workmanship, novelty of construction, beauty of design, or goodness of manufacture, combined. At first sight it may appear strange that the same reward has been given to a child's toy

and to the botanical models in wax of flowers; to the important chemical art of stearic candle-making, and to the apparently insignificant sugar-confectionary. On reflection, however, it must become evident that the only method of making the Awards was to discard for the moment the consideration of all Arts except the one immediately under discussion, and to reward excellence in that one, irrespective of its value as compared with any other. The estimation of the amount of merit recognised by a Medal must, therefore, mainly depend on the nature and difficulties of the manufacture for which it is given, and marks only that an individual Exhibitor has attained a degree of perfection in no case inferior to that to be expected from the existing state of the art as evinced by the examples in the Building, or known to have been produced elsewhere. In the same branch of industry questions of relative merit were only so far gone into as not to reward mediocre or bad productions; and consequently it will be seen that the Medal is in most cases a mark of *positive*, and not of *relative* merit, the Jury not having pretended to select the *best* only, but also the *very good*. This will be best illustrated by quoting an example, and for that purpose one of the most important arts is selected, namely, that of soap-making. In this no extraordinary superiority of any one manufacturer was evinced above all the rest, but a great number had attained a high degree of perfection, in which only differences of degree might be traced. It is evident that the Jury could not have selected any one, or even two or three, for reward without doing an injustice to many others; and it became necessary either to give no Medals at all, or to give one in all cases of decided merit. The Jury chose the latter alternative.

The distinction of Honourable Mention has been accorded in those cases where the merit of the Exhibitor was far above mediocrity, yet still below that of the recipients of the Prize Medal.

The detailed Report is arranged in an order slightly differing from that set forth at the commencement of this introduction, the following being the arrangement which was decided on:—

A. *Manufactures depending upon Chemical principles.*

Soap and Perfumery.
Candles.
Protean Stone, or Artificial Ivory.
Blacking.
Chemical Matches.
Confectionary, and Fruits preserved in Sugar.

B. *Manufactures relating to Natural History.*

Artificial Flowers.
Taxidermy.

C. *Articles connected with Education.*

Educational Models.
Ethnographical Models.
Collections of Produce.

D. *Manufactures for Personal Use.*

Dressing-cases, Writing-desks, Work-boxes, &c.
Umbrellas and Parasols.

Walking-sticks.

Fans.

Pipes and Amber-manufactures.

Snuff-boxes.

E. *Manufactures relating to Amusements.*

Apparatus for Manly Games, viz., Cricket, Archery, Rackets.

Fishing-tackle.

Toys.

F. *Miscellaneous.*

Including all articles not sufficiently numerous or important to be classified under distinct heads.

The plan followed has, in most cases, been to give a short historical sketch of the progress of an art, to discuss the scientific principles on which it is based, and to add such a description of the process employed as to enable the general reader to comprehend its chief details. The productions of each country, in alphabetical order, are then stated, and, lastly, the chief contributions of the successful Exhibitors are specially noticed. The Report, however, is necessarily unequal in its details; some notices being much more complete than others. The Reporters are quite aware of these and other defects, and can only plead the very great difficulty of obtaining correct information on such a variety of subjects as the Report contains, and the very diversified nature of the goods exhibited.

The Reporters have great pleasure in thanking their colleagues, Viscount Canning and Mr. Arthur Henfrey, for Reports on special subjects; M. Natalis Rondot, for information respecting the arts in France and in China; and Mr. J. J. Mechi, for the communication of statistics in some branches of trade; and, lastly, in acknowledging the assistance of their friends, Mr. Richard Thomson, Librarian of the London Institution, and Dr. Anthony, in supplying much historical matter. The Commissioners of Her Majesty's Customs, and John Wood, Esq., the Chairman of the Board of Inland Revenue, have also obligingly furnished the Reporters with statistical information respecting the Imports into, the Manufactures of, and the Exports from, the United Kingdom; for which they take this opportunity of publicly expressing their best thanks. They have also made free use of those valuable French and Belgian Reports, entitled respectively "*Rapport du Jury Central sur les Produits de l'Agriculture et de l'Industrie Exposés en 1849*," and "*Rapport du Jury et Documents de l'Exposition de l'Industrie Belge en 1847*."

A.—MANUFACTURES DEPENDING UPON CHEMICAL PRINCIPLES.

I.—SOAP AND PERFUMERY.

The first of the two branches of industry now to be considered is probably of greater interest than any which will be discussed in the succeeding sections. The magnitude of the manufacture of soap, the importance of the trade, and the enormous capital embarked in it, as well as the wonderful relation which it bears with regard to the most important links in the chain of chemical industry,

is not often sufficiently estimated. A distinguished chemist* of the present day says—

“The quantity of soap consumed by a nation would be no inaccurate measure whereby to estimate its wealth and civilization. Political economists, indeed, will not give it this rank; but whether we regard it as joke or earnest, it is not the less true, that, of two countries with an equal amount of population, we may declare with positive certainty, that the wealthiest and most highly civilized is that which consumes the greatest weight of soap. This consumption does not subserve sensual gratification, nor depend upon fashion, but upon the feeling of the beauty, comfort, and welfare attendant upon cleanliness; and a regard to this feeling is coincident with wealth and civilization. The rich, in the middle ages, who concealed a want of cleanliness in their clothes and persons under a profusion of costly scents and essences, were more luxurious than we are in eating and drinking, in apparel and horses; but how great is the difference between their days and our own, when a want of cleanliness is equivalent to insupportable misery and misfortune!”

It is interesting to cast a glance upon the early history of this important branch of trade. No mention of soap is to be found in the works of authors prior to the Christian era. The term soap occurs repeatedly in the Old Testament,† but the learned Beckmann‡ has proved, in his *Treatise on Soap*, that the Hebrew word “*Borith*,” which has been rendered soap, rather means alkali. One of the most ancient descriptions of bathing and washing is to be found in Homer’s § narrative of the preparations made by the mother of the lovely Nausicaa for the washing expedition to the river. Life-sustaining meats and refreshing wines, softening oil in golden vessels for anointing the skin, are carefully enumerated; but soap formed no part of the inventory. The Homeric virgins were ignorant of this invaluable oleo-alkaline compound. Pliny || is the first writer who gives us an authentic account of soap. He states that it is made from tallow and ashes, the best materials being goats’ tallow and beech-ash. He was also acquainted with the hard and soft varieties of soap; he calls it a Gallic invention, but states that it was particularly well prepared in Germany, where the men were more in the habit of using it than the women. It served to colour the hair yellow. From the description of Pliny it is evident that he really means soap, although the purpose for which it was employed creates some difficulty: and it would appear that the soap of the ancients contained some colouring agent, and served chiefly as a hair-dye, and likewise as a remedial agent. It does not seem that it was used for the purposes for which it is now almost exclusively employed. Besides several kinds of fullers’ earth, ¶ and plants with saponaceous juices (*struthium*), the ancients availed them-

* Liebig’s *Familiar Letters on Chemistry*, Letter xi., p. 129.

† *Jeremiah*, c. ii., v. 22; *Malachi*, c. iii., v. 2.

‡ Beckmann’s *History of Inventions*, translated by Johnston, fourth edition (Bohn).

§ *Odyss.* vi.

|| Pliny, *Nat. Hist.*, xxviii. (vol. ii., page 328 of Holland’s translation), and in speaking of soap ointment, xxiii., cap. 2, page 158.

¶ Several varieties of fullers’ earth are exhibited in the Grecian section, Nos. 15 and 16, which, in all probability, are identical with those formerly used by the classical ancients; the reader is referred for the details to the *Illust. Cat.*, vol. iii., pages 1402-3. There is also a specimen of fullers’ earth contributed to the South African department by J. Calf (No. 55). See vol. ii., p. 952.



IVORY CASKET.

MATIFAT.

selves of solutions of soda and potash, which continue in use for washing in the present day. Strabo speaks of an alkaline water (soda) in Armenia which was used by the scourers for washing clothes, and we find express mention of the employment of a lye made with the ashes of plants (pot-ashes), in cleansing oil and wine-jars and the images of the gods in the temple.* The method of strengthening the lye by means of quicklime was known, undoubtedly, in the time of Paulus Ægineta. The agent most commonly used for washing garments, however, was putrid urine, which is still employed in the cloth districts for washing wool. The fullers were literally and metaphorically in bad odour, and were required to exercise their trade outside the town, or in unfrequented streets; but they were permitted to place tubs at the corners of the streets for the convenience of passengers and their own profit. Regarding urine in the light of soap, the Emperor Vespasian may be said to have originated the soap-duty, as this source of revenue was not lost sight of by him; though, as Beckmann remarks, it does not appear very clear how the tax was collected.

After Pliny, soap is mentioned by Geber, in the second century of the Christian era, and at a later period frequently by the Arab writers; but although undoubtedly used for washing, it is spoken of chiefly as a remedial agent for external application. It would be a difficult matter to trace the onward progress of soap-making, step by step, but it is certain that the boiling of soap flourished in the seventeenth century, as we possess extensive directions of that date for its preparation.

It is only in the most modern times that the soap manufacture has attained that extraordinary development which distinguishes this branch of trade; various circumstances have contributed to produce it. The valuable researches of Chevreul, although they explain the nature of saponification, have contributed less to the advance of the soap-manufacture than to that of candle-making, hereafter to be described. On the other hand, the development of the manufacture of soda has proved a most powerful stimulus to that of soap, which, when freed from its dependence on the uncertain and limited supply of barilla and kelp, made such strides as could not have been anticipated. Mr. James Muspratt, who was the first in England to carry out successfully, and on a large scale, Leblanc's method of preparing soda from chloride of sodium (sea-salt), informs us that he was compelled to give away soda by tons to the soap-boilers before he succeeded in convincing them of the extraordinary advantages to be derived from the adoption of this material. As soon, however, as he had effected this, and when the soap-boilers discovered how much time and money they saved by using artificial soda, orders came in so rapidly that Mr. Muspratt, to satisfy the demand, had his soda discharged red-hot into iron carts, and thus conveyed to the soap manufactories. From that period a constant race was kept up between soap-making and the artificial production of soda; every improvement in Leblanc's process was followed by an extension of the soap trade, and it is a curious fact that the single seaport of Liverpool exports annually more soap at present than did all those of Great Britain previous to the conversion of chloride of sodium into carbonate of soda.

* Egypt has sent some very interesting specimens of *Natron*, or native sesquicarbonate of soda; this salt is the *trona* of mineralogists. Tunis has also contributed a specimen. See Egypt, Nos. 11, 16, 17 (*Illust. Cat.*, vol. iii., p. 1408), and Tunis, No. 149 (p. 1416).

The manufacture of soap has, on the other hand, been a powerful stimulus to the preparation of soda and of the important secondary product, hypochlorite of lime (bleaching powder), which are so intimately allied with almost all branches of chemical trades: thus soap occupies one of the most important pages in the history of applied chemistry. The increase in the consumption of this article has led, moreover, to the discovery of new materials for its production; it has opened new channels to commerce, and thus it has become the *means* as well as the *mark* of civilization. Almost simultaneously with the employment of soda, the oils of the cocoa-nut and the palm have been introduced into the manufacture of soap. The following statistics respecting the imports into the United Kingdom and France best demonstrate the increasing consumption of these oils:—

Imports of Palm-oil in	-	1820	-	-	Cwts. 17,456
"	"	1830	-	-	213,476
"	"	1840	-	-	315,503
"	"	1850	-	-	447,796
Imports of Cocoa-nut-oil in		1820	-	-	8,353
"	"	1830	-	-	8,534
"	"	1840	-	-	42,428
"	"	1850	-	-	98,039

The consumption of palm and cocoa-nut oils in France, although considerably less than in the United Kingdom, is rapidly increasing, as will be seen by the following Table.

Imports of palm and cocoa-nut oils into France:—

		Cwts.			Cwts.
1827	-	3		1840	- 4,622
1829	-	70		1845	- 33,691
1830	-	256		1850	- 62,610
1835	-	253			

The development of the trade in palm-oil has contributed largely to the abolition of the iniquitous slave-trade on the west coast of Africa, and in many parts of the coast has entirely suspended it.

Theory of the Formation of Soap.

Before we proceed to the examination of the separate specimens of soaps exhibited, a few words may be said respecting the materials employed in their manufacture. They are, on the one hand, alkalies, and on the other, fatty and resinous substances derived from the organism of animals and plants, especially tallow, lard, palm-oil, cocoa-nut oil, olive-oil, linseed-oil, fish-oil, and common rosin. Although physically and chemically widely distinguished from one another, fats and oils present numerous analogies. None of these substances is a pure chemical compound; the majority are mixtures in varying proportions of different chemical bodies, which may be isolated by mechanical or chemical processes. When this separation has been effected, the isolated substances which are the proximate principles of the fatty or oily bodies, though again differing much from one another, exhibit one common chemical character: when exposed to the influence of powerful decomposing agents, they are broken up in a similar manner, yielding on the one hand an acid, and on the other a neutral body.

All fats may be resolved into two proximate fatty substances, one of which is fluid at the common temperature—it is termed olein ; the other is solid, and is called stearin. The preponderance of one or the other of these proximate constituents determines the state of aggregation of the fat. The body usually designated *stearine* is generally a mixture of the stearin of the chemist and an analogous body, margarin, the two substances differing in their relative proportion according to the source from which the fat is obtained. Thus, the solid fat from sheep (tallow) contains chiefly stearin, that of the pig (lard), and of olive-oil, chiefly margarin ; the solid fat of palm-oil is palmitin, that of cocoa-nut-oil, cocin.

Stearin, margarin, olein, palmitin, and cocin, are all compounds of certain fatty acids with oxide of glyceryl, and may be viewed as substances resembling neutral salts, or rather compound ethers. The changes which all these substances undergo when submitted to the action of powerful bases, is well illustrated by the deportment of olein with oxide of lead (litharge). When boiled with this base, the olein is decomposed into oleic acid and oxide of glyceryl. The former combines with the base forming an insoluble soap, called oleate of oxide of lead (diachylon plaster), and the oxide of glyceryl, separating in combination with water, forms glycerin (hydrated oxide of glyceryl), a substance having a certain analogy with the group of bodies termed alcohols. It remains dissolved in the water employed. If olein is boiled with a solution of potash or soda, oleates of potash or soda are obtained ; but being soluble in water, they remain dissolved together with the glycerin.

The oleates of potash or soda, when separated from the water by processes immediately to be discussed, are what we call in common life *Soaps*. Similar soaps are formed by the remainder of the fatty acids, for example, stearic and margarinic acids. Palmitate of soda, obtained by boiling palm-oil with soda, likewise forms a chief ingredient of many soaps.

Potash and soda, as they occur in commerce, are combinations of the alkaline bases thus denominated by the chemist, with carbonic acid ; and though, by long boiling, they could decompose (saponify) fats, yet the operation is tedious and the saponification generally incomplete. It is better to deprive the alkalies of their carbonic acid, which is done by mixing them with quick-lime and water ; the quick-lime combines with the carbonic acid, forming an insoluble carbonate of lime (chalk), and the water retains the potash or soda in solution, contaminated still with such impurities as the alkalies contained (sulphates and chlorides, for example), and a minute quantity of caustic lime.

Common rosin (colophony) is the residue of the distillation of natural turpentine, and consists principally of pinic acid, together with a little sylvic and colophonic acids. When rosin is boiled with alkalies, carbonated or not, a compound is readily obtained, but of course no glycerin. Thus, when it is boiled with soda, a pinate of soda is chiefly produced. This compound exists in considerable quantity in yellow-soap, and gives to it its distinctive character.

The character of soap is not only affected by the nature of the acids which it contains, but also by that of the alkali which has served for its preparation ; the soaps containing potash are generally soft and pasty, those prepared with soda are hard and solid.

The compounds of stearic, margarinic, oleic, palmitic, cocinic, pinic, and sylvic acids with potash or soda are all readily soluble in alcohol and hot water, but

more so in the former, which, on evaporation, leaves the soap in a translucent state ; hence its application in the preparation of "Transparent soaps." Soaps, however, are insoluble in a solution of many neutral salts, particularly when concentrated ; this property is of great use to the soap-boiler, who employs it for the separation of the soap from its solution in water, generally adding common salt to set the soap at liberty. As soaps are likewise insoluble in strong alkaline lyes, the same end is sometimes attained by boiling down the soap to a certain consistence, when it separates from the excess of lye.

The soap made with cocoa-nut-oil is, however, soluble in very strong brine, and the same plan of separation does not succeed with it ; but as it is more generally employed together with other fats, this difficulty is then overcome. Its property of dissolving in salt water renders it peculiarly adapted to the formation of a *Marine soap*. One remarkable property of cocoa-nut-oil-soap is, that of solidifying with a much larger quantity of water than most other soaps, thus giving a larger yield, but, of course, being of proportionally less value. This property is, however, unfortunately often turned to profitable account by the soap-maker. As an instance, may be quoted an analysis of Dr. Ure, who found a London cocoa-nut-oil-soap to contain 75 per cent. of water, whereas 25 per cent. of water is a large quantity for any but potash-soaps to contain, and these generally contain less than 50 per cent.

The greater part of our knowledge concerning the chemical constitution of fats, and the changes which accompany their decomposition under the influence of alkalies, is due to the masterly researches of Chevreul, prosecuted with wonderful acuteness and perseverance from 1813 to 1823, when they were published in Paris, in a collected form, under the title of "*Recherches Chimiques sur les Corps Gras d' Origine Animale*," a work which will ever remain a model of philosophical inquiry.

Processes.

There are two processes chiefly employed in the preparation of soaps, the most simple of which is that called the *Cold-process* (from the combination being attained at temperatures below the boiling-point of water), or the *Small-boiler process* (as it is generally effected in comparatively small vessels). For the purpose of making soap in this manner, the alkaline lye is prepared from the purest commercial soda, and concentrated by evaporation. As the chloride of sodium and sulphate of soda, which commercial soda contains, are nearly insoluble in a strong alkaline solution, they crystallize out, especially on allowing the lye to stand for some days, thus leaving it much purer. A weighed quantity of fat is melted, and the strength of the lye having been previously ascertained by taking its specific gravity, a certain portion is weighed or measured, and separately heated and then stirred with the melted fat. Saponification soon occurs, and, on cooling, the soap solidifies. It is very evident that soap made in this manner must contain the glycerin ; moreover, as it is very difficult to obtain an exact neutralization of the fat or alkali, one or the other is often in excess, generally the fat ; this prevents such soap from giving so good a lather as those prepared by the more usual method.

The ordinary method is called the *Large-boiler-process*, as it is usually conducted on a very large scale, in boilers capable of holding many tons. A quantity of weak soda-lye is put into the iron or copper boiler and raised to the boiling-point,

and the whole of the fat is generally added at one time. The ebullition is then carried on for some hours, and when the lye has become exhausted of its alkali, it is pumped away, and a fresh portion of lye is added. After repeated boilings and pumpings, the saponification is completed, and the soap is brought to strength by boiling down.

Now the soap-boiler may wish to prepare either white or mottled soap. If a white or Curd-soap is required, the soap is "*fitted*," that is, boiled, with a certain quantity of water, or weak lye, and allowed to settle, when the black impurities ("*nigre*") fall to the bottom, and the soap is then removed to the frames and allowed to cool. These frames are composed of a number of separate planks, to facilitate the removal of the soap.

The Mottled-soap is prepared in a similar manner, except that the operation of fitting is dispensed with, and the "*nigre*" is left in the soap. This nigre consists chiefly of sulphide of iron, produced by the action of the lye, which always contains a minute quantity of sulphide of sodium, on the vessel. In Marseilles, and other countries where olive-oil-soap is made, a quantity of sulphate of iron (green copperas) is added, and in this case, the mottling is produced jointly by the sulphide of iron (the black portion) and a true iron soap (the red portion). In order that the metallic compound may not fall to the bottom (as in *fitting*), the soap has to be much more concentrated; when removed from the boiler it is of one uniform slate tint, but as it cools, the metallic compounds separate into nodules, and by the trickling of the excess of lye through the mass, they take up certain forms, which produce the appearance called mottling. Hence mottled-soap is of more value, from its containing a less proportion of water.

It is evident, on comparing this with the cold-process, that it is much more scientific, as an excess of alkali may be employed to insure complete saponification, with the perfect certainty that it can be got rid of in the lyes; the glycerin is also removed with the impurities contained in the fat, at each pumping; and a very pure chemical compound is obtained, notwithstanding the employment of comparatively impure materials. If the soda-ash employed does not contain sufficient saline impurities to throw up the soap, it is necessary to add a solution of common salt to effect this object each time the exhausted lye is pumped off.

There have been several patents for changes in the process of the manufacture of soap, one of which (by Arthur Dunn) was for effecting the saponification in close vessels, at a very high temperature, 154°·5 C. (310° F.); this plan has not, however, been generally adopted.

Another patent was obtained for an exactly opposite plan, by Mr. Hawes, who, making use of strong lyes and much mechanical mixing, effects the saponification of the fats in a comparatively cold state. The product is then put into a copper and "*fitted*" in the ordinary manner.

Several patents, taken out for supposed improvements, are in reality plans for the adulteration of soap; amongst which may be instanced the preparation of soap from bones, fish, &c., which is merely introducing an adulteration of gelatin. Other plans consist in the introduction of Cornish clay, fullers' earth, and other similar materials.

The Floating-soap, exhibited in many Foreign Sections, is prepared by melting ordinary soap with the addition of a certain quantity of water, and then beating

it into a thick froth, by means of a paddle, until it occupies twice its original bulk. Formerly this kind of soap was made in considerable quantities in England, but it is now very rarely manufactured, and was not exhibited at all in the British Department.

The soap called Silicated-soap, now manufactured extensively at Liverpool, is formed by mixing a basic-silicate of soda (made by boiling powdered flint in a close vessel under pressure with caustic soda) with hard-soap in the melted state. It appears to possess remarkable detergent properties, but is liable to feel gritty in the hand.

Wax-Soap.—This soap, which is made from wax and soda by the paper-hanging makers to mix with their distemper-colours, in order to prevent their rubbing off, cannot be considered as a true soap in the ordinary acceptance of the term. For Brodie's elaborate researches "*On the Chemical Nature of Wax*,"* clearly prove that on boiling wax with weak soda-lye, part only of the wax (the free cerotic acid) is saponified; the remainder, which is a neutral fat or ether (palmitate of oxide of mellissyl*), is not acted upon, and is contained in admixture with the cerotate of soda in the state of emulsion; probably the valuable properties of wax-soap are in some measure due to this circumstance.

Properties and Action of Soap.

The detergent property of soap is usually considered to be dependent entirely on the quantity of alkali which it contains, and hence the question arises why pure alkali should not be employed in preference. An objection to this is the caustic character of the alkali, which is injurious not only to the hands of the person using it, but also destructive of the articles washed, and especially of some colours of dyed goods. By combining with fatty acids, the alkalies are rendered essentially milder in their action without being deprived of their capability of entering into combination with various impurities, and more particularly with certain fatty bodies. The most common explanation of the washing power of soap is founded upon Chevreul's observation, that soaps are decomposed by large quantities of water, giving rise on the one hand to acid-soaps, and, on the other, liberating a quantity of free alkali which remains in solution. According to this view soap is a sort of magazine of alkali, which it gives up in the exact quantity required at any moment when it is rubbed with water. The combination of the alkali with some part of the dirt cannot be denied. Several constituents of this very indefinite admixture of many substances are of an essentially acid character, especially those derived from perspiration: others become acid when exposed on a large surface to the action of the air, in consequence of a sort of spontaneous saponification. This action cannot, however, be the sole *modus operandi* of soap, the valuable properties of which without doubt arise, in a great measure, from its power of dissolving substances which are insoluble in water. We know that certain mineral salts exert a solvent power upon substances which are entirely insoluble in water: thus it is well known that borax causes shell-lac to dissolve with great facility, and the chemist will at once call to mind the remarkable solvent property possessed by a soapy compound ready formed in the animal organism; bile is essentially a combination of an alkali

* *Philosophical Transactions*, Part I., 1849.

with fatty acids (glycocholic and taurocholic,) and it dissolves with great facility the neutral body cholesterin, which, like fats, is insoluble in water. In addition to these two modes of operation, soap doubtless also produces a mechanical effect. The property which it has of increasing the cohesion of water, so as to enable it to form a lather or froth, is most valuable in the removal of solid insoluble particles of dirt which are carried away by the frictional action of the suds when forced into and out of the minute interstices of the substances subjected to the operation of washing, and are kept suspended by the froth and thus prevented from again soiling them.

If we adopt these views regarding the operation of soap, they guide us at once to a correct estimation of its washing capacity. It increases in a direct ratio with the quantity of *true* soap which it contains ; the determination of the amount of water (by the simple device of drying the substance in the state of thin shavings at 100° C., 212° F.), consequently materially assists in the determination of the value of soap. But to arrive at an exact and rigorous knowledge of this value a chemical analysis is necessary, and more especially when adulteration is suspected. We need scarcely remark, that the Jurors were unable to subject to analysis the varieties of soap of the numerous Exhibitors, many of whom had sent ten or more samples of different kinds. They therefore contented themselves generally with comparative trials of the detergent power of the various soaps, and for that purpose they had samples from all the Exhibitors. The toilet-soaps were judged of likewise by their perfume and presentability, and their freedom from gritty particles.

Perfumery.

From the earliest times of which we have any record, the sense of smell has been gratified with perfumes ; the Egyptians applied them as conservative of the bodies of their deceased friends, and as incense before their venerated deities. On the wall of every temple in Egypt, from Meroe to Memphis, the censer is depicted smoking before the presiding deity of the place ; on the walls of the tombs glows in bright colours the preparation of the spices and perfumes for the embalmment of the mummy, and these very mummies and the vases of Oriental alabaster transported to our museums, tell with eloquence the same tale.

From the time of the *Exodus* throughout the long period of Jewish history, Holy Writ records the use of perfumes. Moses speaks of being directed by the Lord to prepare two perfumes, according to the art of the apothecary or perfumer, one of which was to be offered from the Golden Altar, and the other to be used on the person of the officiating priest. The "Spouse" in the Canticles is enraptured with the spikenard, the cinnamon, the aloe, and the myrrh ; and Ezekiel accuses the Jews of diverting the use of perfumes from the Holy things to their own persons. In the New Testament, also, are contained frequent references to the use of perfumes, many of which will be in the memory of our readers. Especially, however, they will remember in chap. xiv. of the Gospel of St. Mark, that when Jesus sat at meat in the house of Simon the leper, "There came a woman having an alabaster box of ointment of spikenard, very precious, and she brake the box and poured it on his head."

Of the use of these luxuries by the Greeks, and afterwards by the Romans, the detail is more copious. Pliny gives much information respecting perfume-drugs,

the method of collecting them, and the prices at which they sold. Oils and powder-perfumes, according to Seneca, were most lavishly used; for even three times a-day did some of the luxurious people whom he describes anoint and scent themselves, carrying their precious perfumes with them to the baths in costly and elegant boxes called "*Narthecia*."

The trade from the East in these perfume-drugs caused many a vessel to spread its sails to the Red Sea, and many a camel to plod over that track which gave to Greece and Syria their importance as markets, and vitality to the Rock-City of Petra. And Southern Italy was not long ere it occupied itself in ministering to the luxury of the wealthy by manufacturing unguents or perfumes. So numerous were the "*unguentarii*" that they are said to have filled the great street of ancient Capua, the *Seplasia*. In short, whether to regale the nostrils of their deities while sacrificing, or their own while feasting, or to prevent those nostrils from being offended by defunct humanity or the exhalations from crowded masses of people, the consumption of perfumes by the ancients was enormous. Happily in modern times the free use of soap has superseded the necessity for their lavish employment.

When we consider that there are some persons who appreciate the strong smelling musk more highly than any other, and another who would "die of a rose in aromatic pain," the definition of a perfume becomes a matter of some difficulty. Notwithstanding, however, the various impressions that volatile substances make upon different constitutions, a few general principles may be determined by which perfumery may be judged. In the first place, it is necessary to distinguish whether the substance is a chemical compound, or whether it is a mechanical combination of various chemicals. In the former case, if carefully prepared, it is independent of the perfume, and its odour, whether agreeable or repulsive, has a determined character of its own. In the latter case, that is, if the scent depends upon a mixture of substances, an opportunity is offered to the manufacturer of exhibiting his skill. Perfumes, on evaporation, should yield no resinous residue, and the various essential oils of which they are made ought to be combined so harmoniously, that none of the components is perceptible, not only at first, but even during the progress of evaporation. The less the ingredients differ from one another in odour and volatility, the less difficult it becomes to achieve this desideratum. Hence well-prepared Eau-de-Cologne is generally considered to be the perfection of perfumery. The constituents of this scent are, so far as is known, the essential oils of the lemon, the citron, and orange, prepared from the fruit in different stages of maturity, and they approximate so closely to one another as to produce a single aromatic impression. Other oils are added to Eau-de-Cologne, but in so minute a proportion that they scarcely demand any notice in comparison with those mentioned. Eau-de-Cologne, that leaves a residuary odour, either of otto-of-roses, oil-of-cloves, or oil-of-cinnamon, after volatilization, however agreeable these oils may be to individuals, must be designated as of inferior quality.

Still much practice is necessary to ascertain differences in the quality of the perfumes, and the task is rendered more difficult if numerous specimens have to be compared; for this reason the Chemical Committee returned repeatedly to the examination of the various specimens before reporting to the Jury, by whom the Awards were only fixed after a further investigation.

Several of the perfumes, or rather essences, exhibited are of particular interest,

and deserve an especial notice. We allude to a series of artificial organic compounds possessing qualities which permit of their substitution for natural volatile oils and essences. Most of them are substances belonging to the group of compound-ethers. The fruity odour of these bodies has been long known, but they do not appear to have been used in flavouring, until the chemist had shown that many of the oils of vegetable origin resemble in their composition the above-mentioned products of the laboratory. For some years past a scent called Winter-green oil has been extensively used in perfumery; it is obtained from an ericaceous plant, the *Gaultheria procumbens*, and is imported from New Jersey in America, where it is obtained in considerable quantities. Chemical analysis of this oil has yielded the interesting result that it is a true compound ether, consisting of salicylic acid and pyroxylic spirit, which may be formed by a combination of its proximate constituents, so as to possess all the characters of the natural substance. This observation was not lost upon commercial enterprise, and several of the numerous ethers prepared by the chemist were soon discovered to present the odour of certain fruits in so marked a degree, that it was difficult not to conclude that the fruits in question owed their smell to these ethers.

Several artificial essences of this kind are exhibited. Neither the time nor the quantity of material at the command of the Reporters permitted them to examine all these products; they are therefore obliged to confine themselves to a notice of the following:—

Pear-Oil is a spirituous solution of acetate of oxide of amyl. The latter may be obtained with facility and to any amount, by distilling equal parts of concentrated sulphuric acid and fusel oil (the oily residue obtained by the rectification of potato or grain spirit) with two parts of acetate of potash. It is remarkable that the ether itself does not possess a very pleasant odour, and that its striking resemblance to that of pears does not become apparent until properly diluted with spirit. Artificial pear-oil is now prepared in large quantities in England. It is chiefly employed in the manufacture of the lozenges called pear-drops, of which the Exhibition presents some specimens, so that the flavour in its applied state may be tested side by side with the perfume.

Apple-Oil consists mainly of valerianate of oxide of amyl. It is obtained as a secondary product in the preparation of valerianic acid, by the distillation of fusel oil with bichromate of potash and sulphuric acid. The distillate has to be shaken up with a dilute potash-solution in order to remove the valerianic acid, when the ether floats on the top, and may be removed with a pipette.

Pine-apple Oil is contributed by most of the Exhibitors of artificial essences; the specimen analysed was found to consist almost exclusively of butyrate of oxide of ethyl, or common butyric ether. It is easily obtained by boiling butyric acid (obtained from sugar by fermentation with putrid cheese) with strong spirit and a small quantity of concentrated sulphuric acid. It resembles the acetate of oxide of amyl in not presenting the characteristic agreeable fruity flavour in a pure state; it requires to be considerably diluted before the odour appears. This oil is largely manufactured in England, and is employed in the preparation of a beverage called pine-apple ale. The process commonly used for its preparation does not yield perfectly pure butyric ether. It consists in saponifying fresh butter with potash; the soap that forms is separated from the liquor, dissolved in strong

alcohol, and distilled with concentrated sulphuric acid. This yields a mixture of butyric ether, and various other ethers, but the liquid obtained is perfectly adapted for the purposes of flavouring.

Cognac Oil and Grape Oil.—Specimens of these oils, especially of the former, are contributed by English, French, and German manufacturers. They seem to be often employed with the view of giving ordinary varieties of brandy the prized flavour of genuine cognac. Unfortunately the samples exhibited are too small to permit of a careful analysis. A few superficial examinations proved undoubtedly that they are compounds of fusel oil dissolved in a large quantity of alcohol; and it is curious that a substance which is most carefully eliminated from brandy on account of its offensive flavour, should be introduced in another form and in minute quantities in order to render the same beverage aromatic.

Artificial Oil of Bitter-Almonds.—As early as 1834, Professor Mitscherlich of Berlin pointed out a peculiar liquid formed by the action of fuming nitric acid upon benzole, and possessing the odour of natural oil of bitter almonds in a high degree. It was called nitro-benzide or nitro-benzole. The preparation of this compound was, however, too expensive to admit of its substitution for natural oil of bitter-almonds, as the sole sources of benzole, at that period, were the compression of oil-gas and the distillation of benzoic acid. In 1844, one of the Reporters* succeeded in demonstrating the presence of this substance in common light coal-tar-oil; and in 1849, C. B. Mansfield† showed, by a careful investigation, that benzole may be easily obtained in large quantities from tar-oil. In the French Department, under the fanciful title of "*Essence de mirbane*," the Reporters met with several specimens of oils, which on examination proved to be nitro-benzole of more or less purity; they were, however, unable to obtain any positive information as to the extent of this manufacture; but it does not appear to be very considerable. The method employed in England for its preparation was devised by Mr. Mansfield, and is very simple; his apparatus consists of a large glass tube in the form of a coil, which at the upper end divides into two tubes, each of which is provided with a funnel. A stream of concentrated nitric acid flows slowly into one of the funnels, and benzole, which for this purpose need not be perfectly pure, into the other. The two substances meet at the point of union of the two tubes, and chemical combination ensues with the evolution of much heat, but as the newly-formed compound flows down through the coil, it becomes cool, and is collected at the lower extremity. It then merely requires to be washed with water, and, lastly, with a dilute solution of carbonate of soda, to render it fit for use. Nitro-benzole is closely allied to oil of bitter-almonds in its physical characters, yet it presents a slight difference of odour which may be easily detected by an experienced person. It is very useful for perfuming soap, and is probably capable of application in confectionary and cookery, as its flavour resembles that of bitter-almonds, without containing any hydrocyanic (prussic) acid.

UNITED STATES OF AMERICA.

The greater portion of the soaps exhibited in the American section are transparent, the preparation of which requires the employment of a large quantity of

* Dr. Hofmann.—W. D. L. R.

† *Quarterly Journal of the Chemical Society*, vol. i., p. 244.

alcohol. This is sufficiently cheap in the United States to permit of its free use by the soap-maker in the production of toilet-soap. Transparent soap is there much esteemed, and forms an important article of commerce. There are Three Exhibitors of transparent, and One of other toilet-soaps, in the American Section, and also Four of soap for household or manufacturer's use.

The American spirituous perfumery, which was found to be inferior to that exhibited by other countries, is contributed by the makers of toilet-soaps. One Exhibitor sends only a tooth-wash or dentifrice.

AUSTRIA.

About 3,750 tons of olive-oil-soap, valued at 235,000*l.*, are manufactured annually in Austria, besides soap made with tallow and other fats. The two large stearic candle-works of Vienna, "Milly," and "Apollo," produce annually about 2,000 tons of oleic-acid-soap, as a secondary product. The chief manufactories of olive-oil-soap are situated in Venice and Trieste, from which latter place there is One contribution to the Exhibition; thus affording an opportunity of judging of the state in that locality of a manufacture which is mainly confined to southern Europe. It appears that lately the production of olive-oil-soap has much decreased in Austria, but this must be attributable to other causes than a deterioration in its quality, which was found most excellent. There are Two contributors of this and other soaps, both of whom have exhibited the floating or froth soap.

The only Exhibitor of perfumery, JOHN MARIA FARINA (748), sent Eau-de-Cologne, which was so liberally distributed by means of a small fountain, that the supply in charge of the attendant was exhausted before the Jury had made the Awards, so that only the residue left in the fountain was submitted to them. As the specimen had evidently lost much of its perfume from exposure to the air, the Reporters, at the request of the Austrian Commissioner M. C. Buschek, and with the sanction of the Executive, examined, subsequently, a fresh sample, which was taken from a cask of Eau-de-Cologne which had remained under the care of the Customs, and which had been overlooked by the attendant. This sample was found to be equal in quality to the Eau-de-Cologne rewarded with Honourable Mention.

BELGIUM.

It is very remarkable that Belgium has sent to the Exhibition no green, soft-soap (potash-soap), for which it has been famous from a very early period, and which, at one time, was an important article of exportation. Even now it is produced to a far greater extent than the hard soda-soap, the manufacture of which was commenced but a few years since, for the preparation of toilet-soaps. There is only One Exhibitor in the Belgian Section, and he sends toilet-soap only.

BRITISH COLONIES.

The British colonies have not yet progressed sufficiently in the art of soap-making to compete successfully with the world, as regards quality; at the same time it must be stated that their productions are, in most cases, creditable. The yellow soap from *Canada* possesses a most disagreeable odour; the fancy soaps are likewise badly made, giving no lather whatever. The *Cape of Good Hope* sends

a specimen of well-made yellow-soap from J. SMITHERS. *India* has contributed soap from Malabar, composed of cocoa-nut-oil and soda, and made up into irregular balls and long bars; this soap contains an excess of alkali, which effloresces at the surface, and is in general a very crude production. From Madras there is a specimen of well-made marine-soap manufactured by F. KEY; and from *Ceylon* ornamented soap, called olas-soap, manufactured at Kandy from cocoa-nut-oil. *New South Wales* sends very creditable specimens manufactured at Bathurst, 140 miles from Sydney; the collection comprises yellow, curd, and toilet soaps. *Nova Scotia* contributes very good yellow-soap manufactured by — CLARKE, of Halifax. *New Zealand*.—J. A. SMITH exhibits good soap made in Auckland. *South Australia*.—The specimens from this colony are all of yellow-soap, which was made by W. H. BURFORD, who is noticed in the List of Awards. *Van Diemen's Land* sends samples of good household soap, made by R. CLEBURNE, of Hobart Town. The *West Coast of Africa* sends specimens, which are interesting, as having been manufactured on the Oil-coast; they consist of soap made with a mixture of palm-oil and palm-kernel-oil, some made entirely with palm-kernel-oil, and soap made with ground-nut-oil. The oils used in their production are likewise exhibited.

EGYPT

A few interesting and excellent specimens of perfumery have been sent from Egypt, comprising Rose-water of Fayoum, Orange-flower-water, and Mint-water of Rosetta.

FRANCE.

Although modern discoveries in chemical science, by furnishing a cheap substitute for barilla, have deprived Marseilles of some of its local advantages, this town is still the chief centre of the soap-manufacture in France, and from its position in the midst of the oil-producing countries, it is likely for a long period to retain the high reputation which for ages it has enjoyed for the olive-oil-soap to which it has given its name.

At one period Marseilles supplied the whole of France with soaps, in addition to large quantities exported to all parts of the world; but this privilege is becoming gradually curtailed by the establishment, round Paris, and other large towns, of soap-manufactories, in which tallow, palm-oil, and other fats, are employed in lieu of olive-oil; besides which nearly all the stearic-candle-makers convert their oleic acid into scouring and household soaps.*

The Parisian perfumers produce excellent toilet-soaps by the "large-boiler-process," remarkable for the fragrant of the perfume, and giving a good lather. In many cases toilet-soap is manufactured by the "cold-process," and is generally of an inferior quality, giving only a disagreeable slime when used in washing; there are, however, samples in the Exhibition free from this defect.

Many French people never use soap to their faces, employing as a substitute aromatic vinegar, a few drops of which are added to the water used in washing.

* M. E. Péligot has proposed to use the oleic acid of the stearic works for the scouring of wool, because it may be readily removed by carbonate of soda. This valuable plan does not appear to have met with the encouragement it deserves, more especially out of France.

Hence the "vinaigre-de-toilette" is an important manufacture, which is chiefly monopolized by Paris, whence it is sent to all parts of France. There are Three Exhibitors of this aromatic vinegar.

Spirituos perfumery is prepared in great perfection by the manufacturers of Paris, some of whom distil their own essential oils; they generally, also, combine with it the manufacture of toilet-soaps, and hence, with a few exceptions, toilet-soaps and perfumery are exhibited together, and have been conjointly rewarded. In the preparation of essential oils, the flowers are placed in a still, with water, and distilled. The vapour of the water carries over with it that of the essential oil, and both condense together, the essential oil swimming on the surface of the water, which, however, always retains a minute portion in solution. To recover this, the water is usually returned to the still and again passed over; M. Piver, one of the French exhibitors, however, instead of so doing, employs the water for the perfuming of pomatum and hair-oil, which, from their attraction for essential oils, withdraw them from the water.

In 1847 there were, it appears,* 110 perfumers in Paris, employing 721 work-people in the manufacture of toilet-soaps, cosmetics, essential-oils, and spirituous and aqueous perfumery, the value of whose productions was 389,680*l.* The workmen earned, on the average, 2*s.* 7*d.* per day; the workwomen, 1*s.* 6*d.*

According to M. Natalis Rondot, 12,042,970 lbs. of soap, valued at 142,012*l.*, were exported in 1850 from France, a quantity which, as will be hereafter seen, nearly equals that exported from Great Britain in the same year: besides which, 3,398,930 lbs. of perfumery, in value 431,638*l.*, were also exported from France.

There are Two Exhibitors of artificial essences in France. One sends simply a series of compound flavourings, intended to imitate the savour of various fruits; the second exhibits two specimens of chemical compounds, namely, artificial essence of bitter-almonds and artificial essence of pine-apple. The Jury did not, however, meet with any confectionary or perfumery in the French Section in which they had been employed.

Of the Nine Exhibitors of soap in the French Section, Two represent Marseilles, and Six, Paris; and, with two exceptions, these manufacturers exhibit toilet-soap only. There is likewise a small contribution of soap from Algiers.

GERMANY.

At one period all soap was manufactured in Germany by the *indirect*, or, as it was called, the *German method*; but this is now fast giving way to the direct method, and will probably be ultimately superseded entirely by it. The indirect method, the result of empirical trials, and perfected only by long practice, is perhaps the most beautiful of all plans for making soap; the formation of this substance depending on a series of reactions, which modern chemistry explains, while at the same time it fully confirms the correctness of the mode of procedure. Soap made on this plan is first prepared as a potash-soap by boiling the fats with a lye made with wood-ashes (a potash-lye), and is then decomposed, while still in the boiler, by the so-called *salting-process* (*Aussalzen*), which consists in adding a strong solution

* *Statistique de l'Industrie à Paris*, par MM. Say et Natalis Rondot. 2^{ème} partie, p. 829.

of common salt (muriate of soda) to it, not merely to separate the soap from the water, but in sufficient quantity to yield the requisite amount of soda to take the position of the potash. The two bases, soda and potash, exchange places; the stronger base, potash, combining with the muriatic acid, and forming muriate of potash (chloride of potassium), the soda combining with the fatty acids, and forming a soda-soap. At one time this plan was of great value to a country like Germany, removed from the source of barilla, and producing little or none herself. Modern chemistry, by furnishing an abundant supply of cheap soda, however, renders this circuitous plan of much less value, and it must therefore give way to the onward march of science.

The Zollverein States of Germany are represented by Four Exhibitors of soap. Three manufacture household and scouring soap of excellent quality; the other, toilet-soaps. Hamburg is represented by One Exhibitor of floating and other toilet-soaps.

The perfumers of Germany are in great force, being Eight in number, and reckoning two John Maria Farinas in their ranks, making no less than four Farinas in the Exhibition, all claiming to be the original. It appears that speculation is carried to so high a pitch in Cologne, that any child, entitled to the surname of Farina, is bargained for as soon as born, and christened Jean Maria; at times this event is even anticipated. The perfumery of Germany is generally very good.

HOLLAND

is represented by One soap-maker, who exhibits olive-oil-soap, and toilet-soap of fair quality.

PORTUGAL

sends the produce of the Royal Soap and Tobacco Contractor. The collection comprises olive-oil-soda-soap (Marseilles); rosin-and-tallow-soap (yellow-soap) and toilet-soaps, all of which are creditable.

RUSSIA.

There are only Two Exhibitors of soap in the Russian Section, one from St. Petersburg, the other from Warsaw. The latter sends very excellent toilet-soaps.

Russia possessed, in 1842, Sixty-four soap-manufactories, which produced soap valued at 205,800*l.*; and, in the government of Moscow, Three manufactories of perfumery, employing Fifteen workmen, which produced goods valued at 5,080*l.*

SPAIN.

The quantity of soap manufactured in Spain is very large, and exceeds that required for her home-consumption, a considerable portion being annually exported to the Spanish colonies. The common hard-soaps are those principally produced, and they are made by the "cold-process." The following is a list of the towns and provinces in which the manufacture is chiefly carried on, the figures indicating the number of manufactories, wherever it was ascertainable:—Badajoz; Caceres; Cadiz 3; Burgos, 4; Gerona; Guadalajara, 2; Guipuzcoa; Huelva, 2; Huesca;

Jaen, more than 10; Logrono; Malaga, 7; Madrid; Navarre, 7; Oreuse; Port St. Maria, 1; Tarragona; Toledo, 4; Valencia; Seville, 12; Soria; Saragossa, 16; Xeres de la Frontera, 1. Madrid is represented by One Exhibitor of hard olive-oil-soap made by the "cold-process," which is sold at about a penny per pound less than that prepared in the ordinary manner. Malaga sends the produce of one of its manufactories, consisting of the ordinary mottled Castile-soap, made with barilla and olive-oil, in the large boiler, the colouring being obtained by sulphate of iron. This soap is very perfect, and is sold at the rate of 5*l.* 11*s.* 3*d.* per cwt., or almost exactly 1*s.* per pound. In 1843 Malaga produced 19,700,000 lbs. of soap; and in 1844, according to information collected on the spot by M. Natalis Rondot, Cadiz, Xeres, and Port St. Maria yielded 450,000 lbs.

SWITZERLAND.

The contributions from Switzerland consist merely of a small quantity of tooth-powder and hair-oil. It is stated that the tooth-powder is in general use, and is prepared from an indigenous stone, which is calcined and pulverized.

TUNIS.

The Tunisian soaps are composed of olive-oil and soda, and are made in every part of the Regency, generally in copper vessels, holding from 40 to 50 cwt. each. The soda-lye is prepared by mixing the crude soda with the necessary quantity of lime, and putting the mixture into a reservoir, when water is added; under the reservoir is a well which catches the caustic lye as it flows from a hole in the bottom; from the well it is transferred to a copper vessel, and mixed with a proportionate quantity of oil, and boiled until it is made either into a hard-soap, or into one of a softer sort. The price of the hard-soap is from 30*s.* to 32*s.* per cwt., according to that of the olive-oil; the soft-soap is about 25*s.* per cwt. Soap is a very important article of commerce in Tunis, and is generally used by the lowest classes, whose habits of cleanliness are remarkable. There are five specimens of soaps made into bars; a toilet-soap, moulded by putting it into a small brass cup; and a jar of soft-soap; all of which are of a very primitive make.

The Tunisian collection of perfumery consists of scented waters without any admixture of alcohol; they are prepared by distilling the flowers with water in a copper still. The Ottos of Tunis, which are obtained by repeated distillations, are prized as being more fragrant, and are consequently more costly, than those made in Eastern countries, the usual price being from 3*l.* 15*s.* to 5*l.* per ounce,* according to the description of flower from which they are obtained. Perfumery constitutes a most important branch of commerce in Tunis, a great quantity of scented waters being annually exported to France, Genoa, and Malta. There are also specimens of Swak, which is used by the Moorish women for whitening their teeth; and perfumed necklaces, noticed in the List of Awards.

* In documents published from time to time by the French Minister of Commerce, it is stated that the common otto-of-rose is sold in the bazaars at 5 piastres the mitkal: reckoning the mitkal at 4.78 grammes, or 73.774 troy grains, the avoirdupois ounce of 437.5 grains would cost 18*s.*

TURKEY.

Turkey has sent a great variety of soaps, many of which are perfumed with musk, and ornamented with inscriptions; one kind, from Adrianople, is made up into hollow balls, containing a small bell, similar to those sometimes attached to the collars of horses; the Reporters could not, however, ascertain the purpose of the bell. The collection comprises soap from Adana, Adrianople, Candia, Jerusalem, Damascus, and Tripoli, besides a soft-soap called Alicant soap. None of these soaps afford a good lather.

The perfumery consists of:—orange-flower water, and rose-water, both very fragrant; Tensouh or musk paste; Kouderma or pastilles, for burning in the Seraglio; Tensouh or musk-paste medallions, purses, and necklaces; and amber Tesbihs or Chaplets, made of a paste composed of various perfumes. As the names of the Exhibitors of these various articles are not given, and as it appears that the specimens were bought at the bazaars, they are included in one general Award to the Sultan.

TUSCANY.

Tuscany sends the produce of One Exhibitor, comprising olive-oil-soap, tallow-soap, and yellow-soap; the two former may vie with any in the Exhibition. But the yellow-soap is not equal to that of English manufacture. In 1848 Tuscany possessed Sixty manufactories of soap and candles.

UNITED KINGDOM.

In no country in the world is the manufacture of soap carried on to so large an extent as in the United Kingdom, in which there are Three hundred and twenty-nine makers, besides Sixty-eight soap-remelters (perfumers). Ireland not being subject to a duty on soap, there are no ready means of ascertaining the quantity which is there manufactured; but in Great Britain alone the production amounted in the year 1850 to 204,410,826 lbs., and yielded an Excise-duty of 1,299,232*l.* 10*s.* 2*d.* Of this quantity 12,555,493 lbs. were exported to foreign parts, the drawback on it being 82,308*l.* 18*s.* 9*d.* The total quantity consumed in Great Britain, therefore amounted to 191,855,333 lbs. Of this quantity 22,858,382 lbs. were used by manufacturers, on which the duty, amounting to 97,342*l.* 0*s.* 11*d.*, was remitted. This leaves the net revenue derived from the soap-duty at 1,119,581*l.* 10*s.* 6*d.*, after deducting the drawback and the remission to manufacturers. Deducting the quantity exported, and that used by manufacturers, it appears that 168,996,951 lbs., or, in round numbers, 75,445 tons, were consumed in 1850 for domestic use in Great Britain (making 8 lbs. 1 oz. each person); besides that manufactured and consumed in Ireland, of which there are no returns. The Excise-duty was first imposed in Great Britain in 1711, the rate being 1*d.* per pound. In 1713 it was raised to 1½*d.* per pound, and in 1782 the duty on hard-soap was fixed at 2¼*d.*, and that on soft-soap at 1¾*d.* per pound. In 1816 the duty on hard-soap was raised to 3*d.* per pound, at which rate it was levied until May 31, 1833, when the duty was reduced to 1½*d.* per pound on hard-soap and 1*d.* per pound on soft-soap. The present duty is according to these rates, with an addition of 5 per cent. The collection of

this duty (notwithstanding the great improvement in the Excise-regulations of late years) places the British manufacturer under certain restrictions as to his operations, which prevent him from conveniently making toilet-soap. In order to obtain toilet-soap the ordinary soap has to undergo a second process of clarification, and, after having been perfumed, has to be made up in some presentable form ; it is this which has given rise to the business of the soap-remelter, who buys his soap of the maker, remelts, perfumes, and then makes it into tablets. Two Exhibitors, however, of toilet-soap, carry on all the operations in their works. In Ireland the perfumer generally makes his own soap by the "cold-process;" and One Exhibitor sends toilet-soap made in this way.

Several descriptions of fat are used by the British soap-maker, the principal one being tallow (prepared from the inside and outside fat of oxen and sheep), which is imported in large quantities from Russia, South America, and Australia, the produce of the two last-named countries being more generally employed. Palm-oil, rosin, and cocoa-nut-oil are likewise used, to which must be added bone-fat and "kitchen-stuff." Kitchen or "rough stuff" is collected from private families, where it is usually the perquisite of the cook, who frequently adds a few candles and occasionally a potato in order to increase the weight. The kitchen-stuff is bought up by the stuff-collectors from the rag and oil shops, and then sold to the soap-maker, who melts it down previous to use.

Before the repeal of the duty on salt, large quantities of barilla (then the only source of carbonate of soda) were imported into this country from Sicily, Teneriffe, and Carthagen for the use of the soap-maker ; its repeal was most beneficial from the stimulus it gave to the manufacture of soda from sea-salt, destined soon to supply exclusively the wants of the soap-boiler, who after a short time discarded the impure barilla, which not only was much more costly, but had to be ground to powder in a horse or steam-mill, before the lyes could be prepared, the operation usually occupying two days ; whereas the soda-ash (prepared in enormous quantities in Liverpool, Glasgow, and Newcastle), besides containing twice as much soda as the barilla, comes to him in a powdered state ready for immediate use, and enables him to prepare the lyes in a few hours.

Within the last three years the soap-manufacturer has been supplied with fine American rosin (colophony), very much purer and of a much paler colour than that of English make ; from this cause yellow-soap has been much improved, and is now made of a beautiful pale yellow colour (primrose soap).

Yellow-soap, first manufactured in England, is that produced in the largest quantities, and is composed of tallow, rosin, and soda. Mottled-soap is next in importance, and is usually made from kitchen-stuff and soda. Curd-soap, which is used to a great extent by the cloth-manufacturers of Yorkshire, and the lace and stocking-bleachers of Nottingham, is made with tallow and soda (100 lbs. of tallow yielding from 150 lbs. to 155 lbs. of perfect curd-soap). Besides these there are various other kinds, as, for example, palm-oil-soap, which is usually prepared as a component of yellow-soap ; cocoa-nut-oil-soap ; and other kinds prepared chiefly for exportation, in which a low price, unfortunately, is a more important consideration than a high quality.

Soft-soap is made with potash (instead of soda) and various kinds of oils ; Greenland, Southern, and other fish-oils being generally employed, when the soap is

intended for the cloth-districts. There is usually a small quantity of tallow mixed with the oil, so as to produce the fig-like appearance common in soft-soap: this is due to the stearate of potash formed in consequence of this addition, and which is less deliquescent than oleate of potash. Sometimes lime is added to imitate the white particles, but it is easily detected on dissolving the soap in water.

At present very little soap is made in this country from olive-oil, partly because, since the alteration in the duty on foreign soap, its manufacture does not repay the soap-maker, and partly on account of the "London New Pharmacopœia" directing soft-soap to be used in lieu of "Castile-soap," as it is found to be better adapted for the retention of a proper degree of moisture in pharmaceutical preparations.

Of the 329 soap-makers of the United Kingdom, only Seven come forward to represent the soap-trade. On comparing the productions of other nations with theirs, it is evident that, as regards tallow, palm-oil, and resin-soaps, the British soaps are generally better manufactured, notwithstanding the excise-restrictions under which the English manufacturer labours.

The English toilet-soaps are in no respect inferior to those of other countries, and are generally far superior in their detergent qualities, on account of their being made from soap manufactured exclusively by the "large-boiler process." The high reputation of the so-called Windsor-soap in all civilized states is an ample testimony of the estimation in which English toilet-soap is held by the makers of other countries, who adopt its name for any sort they wish particularly to recommend. The preparation of toilet-soaps is generally confined to the remelter, who perfumes and ornaments them in various ways. The marbling is effected by rubbing up the colours, such as vermilion or ultramarine, with a little olive-oil or soap, and taking a small portion on a palette-knife, which is pushed through the melted mass, and moved about according to the fancy of the operator. Many soaps are coloured throughout their mass with mineral colours. Vermilion is used to produce the pink colour of rose-soap, artificial ultramarine to produce blue, and various ochres to produce browns. Tablets are made by placing a soft mass of soap into a mould, fixed in a lever-press, and composed of a top and bottom die, which fit into a loose ring; by a rapid pressure the shapeless mass takes the form of the ring, and is at the same time embossed on the top and bottom of the cake. The ornamenting by means of coloured cameos is effected in a similar manner, but requires two presses, one of which forms the cake, and makes depressions for the reception of a different coloured soap, which is filled in by hand, and the cake is then placed in the second press, which embosses the coloured portion.

No less than Twelve out of the Sixty-eight soap-remelters of Great Britain exhibit. Most of them send also perfumery; and Eight manufacturers, besides the Twelve above named, exhibit perfumery only. The English perfumery was found in many cases to be very fragrant and agreeable, but in others the employment of an excess of some strong-smelling essential oil rendered the compound anything but a desirable article for the toilet. The Imports of Perfumery into the United Kingdom in the year 1850 were valued at 1,907*l.*, and a duty was paid of 191*l.*, but in all probability some spirituous perfumes are included under the head of "Oils, chemical, essential, and perfumed," of which 172,139 lbs. were imported and which yielded a duty of 12,772*l.*

Two Exhibitors have contributed specimens to which allusion has been made in

the preceding pages, and to which a great degree of interest attaches, as being among the first attempts at the application of harmless chemical compounds for the imitation of the flavours of fruits and liqueurs, namely, Oil-of-Pears, Oil-of-Apples, Oil-of-Pine-apples, Oil-of-Cognac, Oil-of-Grapes, and Onion-Sauce.

There are Ninety-five Exhibitors of Soap and Perfumery; of this number Sixty-two are solely or chiefly manufacturers of soap, and Thirty-three solely or chiefly makers of perfumery, though many of the perfumers send both soap and perfumery. Of those who exhibit soap, Seven (English) are merely remelters and perfumers of the goods they purchase of the soap-boilers; Five are makers of a floating or foam-soap; and Four exhibit soap made by the "Cold-process."

Among the perfumers there are Two who exhibit savory sauces, and Five, the artificial essences before described.

Of the Ninety-five Exhibitors there are—

31 Holders of a Prize Medal.
18 Who obtained Honourable Mention.
46 Unrewarded.

95

The number of Exhibitors from the various countries is as follows :—

America, United States	-	-	9	France and Algiers	-	-	-	14
Austria	-	-	4	Germany, Zollverein and North Ger-				
Belgium	-	-	1	many	-	-	-	13
British Colonies :—				Holland	-	-	-	1
Canada	-	-	2	Portugal	-	-	-	1
Ceylon	-	-	1	Russia	-	-	-	2
Cape of Good Hope	-	-	1	Spain	-	-	-	2
India	-	-	2	Switzerland	-	-	-	1
New South Wales	-	-	1	Tunis	-	-	-	2
Nova Scotia	-	-	1	Turkey	-	-	-	3
New Zealand	-	-	1	Tuscany	-	-	-	1
South Australia	-	-	1	United Kingdom	-	-	-	27
Van Diemen's Land	-	-	1					—
West Coast of Africa	-	-	2					95
Egypt	-	-	1					—

Besides this number, Eight stearic-candle makers have also sent soap made with the oleic acid, derived as a secondary product from their manufacture: these eight raise the number to One hundred and three, but no special notice will be given of their productions in this portion of the Report.

LIST OF AWARDS.

ALLARD and CLAYE, Paris (France, No. 750). Prize Medal. A collection of fancy Toilet-soaps, in large blocks, marbled and otherwise ornamented; soap in cakes and balls; Potash-shaving-soap. These soaps are made in the ordinary manner, in the large boiler, and afterwards perfumed; they are most agreeable in use, giving very readily an abundant lather, and are free from an excess of alkali. Their perfumery is of various kinds, and very good.

ARNAVON, H., Marseilles (France, No. 402). Prize Medal. A very large collection of Marseilles mottled (Castile-soap), Yellow palm-oil, and Bleached palm-oil-soaps. The yellow soaps are not so slightly as those manufactured in England, but are good. The mottled Marseilles soap is, however, excellent.

BAZIN, XAVIER, Philadelphia (United States, No. 36). Prize Medal. A very large collection of fancy-soaps; Transparent-soaps, made up into cakes and balls; Transparent-shaving-paste; Hazel-nut-oil-soap; busts of American *savants*. The soaps are well manufactured, fragrant and agreeable.

Besides the above, various spirituous perfumes are exhibited, which are not included in the Award.

BLEUZE, H., Paris (France, No. 1091). Honourable Mention. Soaps and perfumery. The soaps are manufactured by the "cold-process," and they give a tolerable lather.

BURFORD, W. H. (South Australia, —). Honourable Mention for well-made Yellow-soap.

BUSCH, P. A. (Frankfort, No. 2). Honourable Mention for Rectified Cognac-oil.

CADWELL, PAYSON, and Co. (United States, No. 510). Prize Medal. A soap called Excelsior-soap, not very slightly, but possessed of remarkable detergent properties, especially in very strong brine. In the trial made with this soap, it was found to possess the valuable property of readily removing tar even in salt water, which renders it peculiarly well adapted for a Marine-soap. A comparative trial was made at the same time with scouring-soaps, selected from the best in the Exhibition; they all answered as well as the Excelsior-soap, except in the removal of tar when washing with a solution of salt.

Much stress was laid on the low price (30s. per cwt.) at which this soap may be produced; but as on examination it was found to contain earthy matters, with which any soap may be much reduced in cost, the lowness of the price did not influence the Jury in their Award.

CHIOZZA, C. L., and SON, Trieste (Austria, No. 43). Prize Medal. Soaps of excellent quality and in great variety. Superfine Marseilles; Blue-marbled; Floating white-Genoa; Hard imitation English soap; Cocoa-nut-oil-soap; common Floating rose-coloured soap; white Curd-soap, for toilet purposes, also Blue and Red-marbled; Cocoa-nut-oil toilet-soap; besides various scented soaps; all of which afford an excellent lather, and are, in every respect, carefully manufactured, and free from an excess of alkali.

CLEAVER, F. S., 18 Red Lion Square (Class XXIX., 20). Prize Medal. Mr. Cleaver is a soap perfumer and remelter; his large and varied collection comprises the following descriptions:—Honey-toilet-soap; this soap contains no honey; it is perfumed with the essence of citronelle, and is a very agreeable toilet-soap. May-blossom-soap is a honey-soap containing cream of tartar. Peach-blossom-soap is a composition flavoured with oil of bitter almonds, and made up into balls, which derives a peculiar peach-like partial stain from the addition solely of cream of tartar. Soaps marked by Dunn's process of lettering, which consists in stamping recesses of the shape of the letters, and filling them with soap of a different colour. (See page 1356.)

All the soaps are of most excellent quality, very fragrant, and afford a copious lather.

COLLAS, M. A., Paris (France, No. 801). Honourable Mention. (*The same Award by the Jury of Class II.*) Artificial essence of Bitter-almonds; artificial essence of Pine-apple. (See pages 1347 and 1348).

CONTI and SON, Leghorn (Tuscany, No. 23). Prize Medal. Olive-oil-soap (white Marseilles); Olive-oil-mottled-soap (Castile-soap); Tallow-curd-soap; most excellent in quality.

COWAN and SONS, 139 New Gravel Lane, Shadwell (Class XXIX., No. 19). Prize Medal. Pale-yellow-soap of very excellent quality; Curd-soap, most carefully prepared; Marine-soap, for washing in salt water. This collection, though comprising few varieties, is valuable from its showing the degree of excellence attainable in the art of soap-making.

DE LEON Y RICO, E., Madrid (Spain, No. 243). Honourable Mention. A very hard Olive-oil-soap, made in 24 hours, by the "cold-process." It affords a lather with some difficulty at first, but by the second day's use acquires a little moisture and then gives one more readily. This plan of making does not yield a soap equal to that of the "large-boiler-process," but the specimen is very good of its kind, and free from excess of alkali.

DOUGLAS, J. S., and SONS (Hamburg, No. 92). Prize Medal for Toilet-soaps, made from cocoa-nut-oil and soda (probably by the "cold-process"); Marbled-soap, made from tallow; likewise the Floating or froth-soap; all of which are of good quality. This latter, in the true spirit of puffing, is alleged to be made according to a recipe which a friend transmitted from China, and which he obtained by bribery, on penetrating into the Imperial Soap-Manufactory of Canton.

EDE and Co., 47 Ludgate Hill (Class XXIX., No. 18). Honourable Mention for a case containing Perfumery of various kinds. The imitation of the scent of flowers was found in many cases to be successful.

FARINA, JOHN MARIA, 23 Rhein Strasse, Cologne, and 1 Salter's Hall, Cannon Street, London (Class XXIX., No. 21). Honourable Mention. For a long period after the opening of the Exhibition, Mr. Farina distributed his fragrant Eau-de-Cologne, with great liberality, by means of a fountain.

The specimens exhibited in bottles were of excellent quality, evaporating perfectly without resinous residue.

FARINA, JOHN MARIA, Cologne (Prussia, No. 426). Honourable Mention. Very fragrant and agreeable Eau-de-Cologne, evaporating perfectly without resinous residue.

FARINA, JOHN MARIA, opposite the Julichs Place, Cologne (Prussia, No. 858). Prize Medal. Eau-de-Cologne of most excellent quality, possessing in a high degree that fragrance and freedom from unpleasant residuary odour for which this article of toilet is esteemed.

FARINA, JOHN MARIA (Austria, No. 748). Honourable Mention. (See Introductory matter, Austria, page 1349.)

FISHER, T. W., and Co., King's Head Court, Barbican (Class XXIX., No. 22). Honourable Mention. Three cases of perfumes, and a sauce known as Harvey's sauce. The Jury accord an Honourable Mention of the perfumery, which is fragrant and leaves no residuary unpleasant odour after evaporation.

GELLÉ and Co., Paris (France, No. 845). Prize Medal. For a very large collection of fancy Toilet-soaps, made by the small-boiler, or *cold-process*,

and free from the defect of not giving a lather, which is usually the case with soaps made in this way. And also, for an assortment of very agreeable perfumery.

GIBBS, D. and W., Milton Street (Class XXIX., No. 305A). Prize Medal. These Exhibitors are among the few British soap-boilers who also perfume their soaps for toilet-purposes. Their soaps for manufacturers' use comprise :—a perfectly neutral Curd-soap, employed by woollen and silk manufacturers for the more delicate goods ; soap used by silk-dyers to give brilliancy to their goods ; and a Black soft-soap, made from the fats recovered by Mr. Bauwens, from waste lyes (see the article on Candles, page 1393) : it is chiefly used for scouring coarse wools and carpets, and is sold wholesale at 2*d.* per lb. The household soaps comprise White-curd of excellent quality ; Mottled equally good ; and very fine Pale-yellow-soaps. The Toilet-soaps exhibited are chiefly those ornamented with inlaid, embossed, and coloured cameos. They are well perfumed, and give a good lather. The Shaving-tablet, contained in a gutta percha case with a moveable bottom, is one of the very best possible contrivances for that purpose.

GIRÓ, JUAN, Malaga (Spain, No. 244). Honourable Mention. Three bars of Olive-oil-mottled or Castile-soap, made in the ordinary manner, in the large boiler. The alkali used in its formation is barilla, which, as before stated, was at one time the only source of carbonate of soda ; but it is almost entirely superseded in other parts of Europe by that prepared from sea-salt.

GROSSMITH, JOHN, 39 Friday Street (Class XXIX., No. 13). Prize Medal. The Jury award a Prize Medal to this Exhibitor for his Perfumery and the manufacture of Artificial-essences applicable to the flavouring of confectionary and other purposes ; for instance, Pine-apple, Jargonelle, Onion, Oil-of-Cognac ; these artificial essential oils are generally used in the proportion of 1 oz. to a gallon of spirit. (See pages 1347, 1348.)

HAUEL, JULES, Philadelphia (United States, No. 4). Prize Medal. Olive-oil-soap, Transparent-toilet-soaps, very agreeable and well manufactured. They afford a good lather.

The Perfumery which is exhibited is not included in the Award.

HENDRIE, ROBERT, Tichborne Street (Class XXIX., No. 10). Prize Medal. A collection of soaps, amongst which are some curious matters. Brown-Windsor-soap ; Amber-soap containing amber-oil ; Wax-soap used to mix with colours for distemper painting ; Petrolin-soap prepared with a mixture of 30 per cent. of Barbadoes tar, and 70 per cent. of soap ; this soap is intended to be used as a remedy in cutaneous affections. Benzo-amygdaline-soap, which is a soap prepared with a mixture of almond-meal and gum-benzoin.

M. Hendrie exhibits likewise a large collection of very good Perfumery.

The Jury have not pretended to discuss the merits of the unusual compounds ; but make their Award on the general excellence of Mr. Hendrie's Perfumery and Toilet-soaps.

KENDALL and Co., Dublin (Class XXIX., No. 25). Prize Medal. These manufacturers have exhibited two cases containing twelve very large blocks of Marbled-soaps, besides sixty boxes of various Fancy-soaps. All the soaps are made by the "cold-process," and consequently contain the glycerin resulting from the saponification of the fat. The materials used in their formation are lard, and a

very pure soda-lye. Great care has been bestowed by Messrs. Kendall and Co. in the manufacture of these soaps.

KNIGHT, JOHN, 9 Old Gravel Lane, St. George's (Class XXIX., No. 8). Prize Medal. Most excellent Primrose or Pale-yellow-soap, made with tallow, American rosin, and soda; Mottled tallow-soap for household purposes, equally good; Soft or potash-soap, having the fig-like appearance, which is much esteemed as an indication of careful manufacture.

LANDON and Co., Paris (France, No. 1290). Honourable Mention for Aromatic-vinegar for toilet purposes, very refreshing, and free from adhesive residue on evaporation.

LANGDALE, EDWARD F., 83 Upper Thames Street (Class XXIX., No. 55). Honourable Mention. A collection of Artificial-essences, now much used for flavouring confectionary and beverages, consisting of the following,—Oil-of-Cognac, Oil-of-Pears, Oil-of-Apples, Oil-of-Pine-apples, Oil-of-Grapes. The Jury accord an Honourable Mention to this exhibitor, for the successful preparation of these various ethers applicable as a substitute for natural fruits. (See pages 1347, 1348.)

LEISTNER, G. L., Paris (France, No. 908). Prize Medal. Excellent Aromatic or Toilet-vinegar; Creosote; Eau-de-Paris, a fragrant and agreeable perfume, resembling Eau-de-Cologne, but possessing a characteristic odour of its own.

LIPP, FREDERICK VON, Düsseldorf (Prussia, No. 658). Honourable Mention. For an agreeable perfume, called Düsseldorf water.

MARTIN, MARIA CLEMENTINE, Nun at Cologne (Prussia, No. 425). Prize Medal. Eau-de-Cologne of very superior quality, being that which was considered the most fragrant and agreeable in the Exhibition. The same odour was found to be persistent throughout the evaporation of a small portion, none of the essential oils becoming distinguishable, which is frequently the case with the inferior descriptions. Also Melisse Carmelite spirit, or holy water (alcohol).

MELZER, D., Hermannstadt (Austria, No. 44). Honourable Mention. The Jury accord an Honourable Mention to the Olive-oil-soap, Fancy-soaps and Floating-soap, which are of fair quality.

MILLIAU, jun., Marseilles (France, No. 929). Prize Medal. White Marseilles or Olive-oil soap. This is a good specimen of the kind to which Marseilles gives its name, and for which it is celebrated.

OGER, J. L. M. (France, No. 939). Prize Medal. Collection of Household and Toilet-soaps in bars and cakes. The household-soaps are excellent, and the toilet-soaps agreeably perfumed; one of these, the Jasper-soap, has a very peculiar jasper-like mottling, not seen in English soaps. The collection also comprises Floating-soap; white Marseilles or olive-oil-soap; tallow or Curd-soap; rosin or Yellow-soap. This collection is very important, and highly interesting, and consists entirely of soaps of the very highest class.

PALIS, A., Berlin (Prussia, No. 263). Prize Medal. Palm-oil-soap and tallow Mottled-soap (with a peculiar wavy mottling), of excellent manufacture and great detergent power. Both the soaps are free from any efflorescence of mineral salts, although they have become very dry.

PEARS, A. and F., 91 Great Russell Street, Bloomsbury (Class XXIX., No. 24). Honourable Mention. The Jury accord an Honourable Mention to Messrs. Pears for a small collection of Transparent-soaps, the manufacture of which they allege

their Father invented upwards of 40 years since. The Jury tried one ball of the soap which was stated to be twenty-five years' old, and found it, though much darker in colour, to be very good. The price of spirit of wine in this country has prevented Messrs. Pears from obtaining a very large sale for this soap, but in America its manufacture is carried on to a considerable extent.

PIVER, L. T., Paris (France, No. 1678). Prize Medal. Various kinds of Toilet-soap; spirituous Perfumery; perfumed Hair-oil and Pomatum; Transparent-potash-soap or Shaving-paste. Two soaps are especially deserving of notice, that called Lettuce-soap, and the Orange-flower-soap, as being perhaps even more agreeable than the others. All M. Piver's perfumes and soaps are of the very highest class.

RIMMEL, E., 39 Gerrard Street, Soho, and Paris (Class XXIX., No. 3.). Honourable Mention. The Jury accord an Honourable Mention for the Perfumery exhibited, which is of good quality. Besides these there are Hair-dye, Perfumed-bouquets, Pomatum, &c.

SARRE, H. Jun., Berlin (Prussia, No. 255). Prize Medal. A block of Palm-oil-soap, and Tallow-curd-soap, well manufactured, of great detergent power, and free from any efflorescence.

STIER, H., Warsaw (Russia, No. 364). Prize Medal for Brown-Windsor-soap, Floating, and other Toilet-soaps, well manufactured and very agreeable.

It is curious to find that the name "Brown Windsor" should have been adopted even in so distant a locality as Warsaw. The soap, moreover, has a great resemblance to that manufactured in this country.

TAYLOR, H. P. and W. C., Philadelphia (United States, No. 292). Prize Medal. A very large collection of Transparent-soaps, some of which are quaintly arranged to form a window, in imitation of stained glass. They are very agreeable, and afford an excellent lather.

TAYLOR and SON, King's Road, Chelsea (Class XXIX., No. 5). Prize Medal. These Exhibitors are perfumers of the soaps which they buy of the soap-boiler, and they have carried to great perfection the art of perfuming and mixing the various sorts of soap so as to produce agreeable compounds for the toilet. The "Old Brown-Windsor-soap" is particularly to be distinguished as one of great excellence. The other soaps are Almond, Otto-of-rose, Lavender, Honey, and Shaving. Besides soaps, Messrs. Taylor and Son exhibit spirituous and aqueous Perfumes, of which they are the distillers, and which possess the fragrance of the respective flowers. The Rose-water, Elder-flower-water, and spirituous Lavender-water, may be cited as examples of great excellence. The spirituous perfumes comprise "Pure Lavender-water," "Perfumed Lavender-water," Millefleurs and Eau-de-Cologne; the aqueous perfumes are, Rose-water, Honey-water, Peppermint-water, and Dill-seed-water.

THOLLON, Grenoble (France, No. 1701). Honourable Mention. Concentrated essences for flavouring liquors; these are very numerous; some resemble the flavours of the fruits which they are intended to imitate, whilst others require a little imagination on the part of the epicure.

TOUCHE-GILLÉS, E., St. Laurent, Antwerp (Belgium, No. 434). Prize Medal. Excellent Toilet-soaps, affording a very abundant lather. The collection comprises very good Olive-oil, or Marseilles soap; tallow, or Antwerp soap; marbled

Antwerp soap ; lard Toilet-soap ; scented Palm-oil-soap, which is most agreeable for the toilet ; also a toilet-soap called "*Savon d'adoucissement*" (emollient soap).

BEY OF TUNIS (Tunis, Nos. 53 to 57). Prize Medal. A collection of a variety of Perfumed-waters (not spirituous). There are Ninety bottles of these perfumes, amongst which may be cited, Rose-water, Quince-water, Apple-water, Musk-water, Jasmine-water, which is very fragrant ; Millefleurs-water, composed of jasmine and other perfumes ; White-rose-water, Aloe-water, Benzoin-water, Citron-water, Cinnamon-water, Carraway-water, Orange-flower-water, water distilled with a mixture of benzoin and other perfumes, Cedar-wood-water. Also perfumed Tablets and Necklaces worn by ladies ; these are composed of a paste made of amber, musk, and aloe. Likewise jasmine pomatum.

The greater portion of the perfumed waters are very fragrant ; some few are peculiar, and to persons unaccustomed to their use, not agreeable.

WILLIAMS, JOHN and SON, 28 Compton Street, Clerkenwell (Class XXIX., No. 4). Prize Medal. A collection of soaps for manufacturing and household purposes, and also perfumed toilet-soaps. These Exhibitors are soap-boilers, as well as soap-perfumers, a combination of two, generally, distinct branches. Their common soaps are exceedingly well manufactured, and are possessed of great detergent properties. The collection comprises, Olive-oil-soap, which is much used by the fine-cloth manufacturers ; White-curd- (tallow) soap, used principally by the lace-bleachers ; Pale-yellow and Mottled-soap, for household purposes ; Scouring-soap, containing designedly an excess of alkali, which effloresces on the surface ; this soap is made chiefly for consumption at Leicester. It answered well for washing in a strong brine, and therefore might be used on board ship.

The fancy-soaps are agreeably perfumed, and give readily an abundant lather. The principal description of toilet-soaps are, Brown-Windsor, Rose-soap, and the so-called Honey-soap.

WUNDER, L., Liegnitz (Prussia, No. 250). Prize Medal. Tallow-soap, with a peculiar wavy mottling, very well manufactured ; Palm-oil soap, of good quality, and excellent white Curd-soap ; the Award is to the foregoing. Besides these, there is a toilet-soap called Ananas-soap, the perfume of which does not at all resemble that of the pine-apple, and is moreover very disagreeable.

YARDLEY and STATHAM, Vine Street (Class XXIX., No. 2). Honourable Mention. A soap called the "genuine Honey-soap," is very good, and gives an excellent lather, but it does not contain any honey. At one time honey was put into toilet-soap, but was discontinued in consequence of the unsightly appearance it produced ; the name, however, is still retained. The other soaps exhibited are, the "True Winter-soap," Heliotrope-soap, White and Brown Windsor-soap, which are equally good.

Many of the Toilet-soaps are stated to have some peculiar emollient and whitening effects on the skin ; it is, however, to be hoped that the public will soon become sufficiently enlightened to buy the soaps for their real and not for their fabulous qualities.

II.—CANDLES.

In tracing the little which is known respecting the early history of Candles, it is impossible to avoid the mention of Lamps also (although these were not amongst the

articles submitted to the consideration of this Jury), as both are intimately connected, not only in their history, but also in their philosophical bearings; for however much candles and lamps may differ in other respects, they are identical in this, that both are contrivances in which, for the purposes of illumination, a wick of fibrous material is employed to effect the combustion of fatty bodies; which, for the most part, under ordinary circumstances, could be ignited only with difficulty, and if ignited, would soon become extinguished. The chief point of difference is, that in the lamp the fuel is a fluid, at the common temperature; whilst in the candle it is liquified only gradually, and in the required quantity, by the heat of the flame. This distinction, however, does not entirely hold good, for it is known that in many countries, especially in those where oil-yielding plants are not common, animal-fat is employed for feeding lamps; and it is even probable that the ancient Hebrews may likewise have used occasionally solid fats for the same purpose. The modern mortar night-light is also a lamp of this kind.

Frequent mention is made of the candle in the Old and New Testaments, in metaphorical as well as literal significations: but from the description of the candlestick of gold which Moses made by the command of God, it is more than probable that the Hebrew expression translated "candle" really means lamp,* for in *Exodus* xxv., after the minute description of the form of the candlestick, with its six branches, it is said, at verse 37, "And thou shalt make the seven lamps thereof, that they may give light over against it." Again, in *Leviticus* xxiv., v. 4, the Lord directs that Aaron shall order the lamps upon the pure candlestick; and in verse 2 of the same chapter, the fuel used in the lamps is shown to have been olive-oil.

Torches† may be regarded as a coarse description of candles, which indeed possibly originated from them. They are mentioned also in Holy Writ, in a passage remarkable as being the only one in the New Testament where the *lantern* is spoken of (*John* xviii., v. 3): "Judas then having received a band of men and officers from the chief priests and Pharisees, cometh there with *lanterns* and *torches* and weapons."

The information respecting candles, mentioned in Pliny's *Natural History*, is very slight and ill-defined. That which is most to the present purpose is contained in book xiii., chap. 13, where, in describing the books reported to have been found in a perfect state of preservation in the grave of Numa, 535 years after his interment, the author states that they lay near a quadrangular stone in a box which was bound all over with *candles*, and to that defence their preservation is ascribed. From this passage it would appear that candles were employed in the earliest ages of the Roman history; and, inferentially, that they resembled in some degree either our longest wax-tapers, or else match-lights made of pitched rope, for short

* In Lane's *Manners and Customs of the Modern Egyptians* there is a description of a folding-lantern of waxed cloth, and the lamp which is put into it. This, in Arabic, is called *Ckandee'l*, with which our word candle may possibly have some connexion; for it is more than likely that the same word was used to designate in former times either lamps or candles.

† British Guiana has contributed an interesting specimen of Torch-wood from the River Demerara, which, when beaten so as to separate the fibre, is used for torches by the Indians. It is supposed to be obtained from a species of *Amyris* or *Icica*.

candles could not have been bound round any object.* In describing in book xvi., chap. 37, the "brittle rushes" that grow in marshy districts, he says that they serve to thatch houses and make mats; and the pith of them, when the rind is peeled off, is used for making wicks for *watch-candles* and funeral-lights, to burn by dead bodies whilst they lie above ground. This description may be considered as referring to candles very similar to, if not identical with the modern rushlight; but as the fat used in their formation is not alluded to, nothing certain is known on the subject.† In book xix., chap. 1, when speaking of flax, Pliny remarks that the fibres nearest the rind are only fit for lamp and candle wicks; and in book xxxvii., chap. 3, that if the scrapings of amber are put into *oil*, they will burn and maintain light both longer and more clear than wicks made of the *best of flax*: from which it would appear that, although the refuse flax was usually appropriated to lamp and candle wicks, the best flax was sometimes used for them.

As regards the fuel used in lamps, in addition to the mention of oil, Pliny, in book xxxvi., chap. 15, states farther that the inhabitants of Sicily burned a kind of bitumen, resembling an unctuous or oily liquor, in their lamps; and that they collected it from the surface of a spring in the territory of Agrigentum. Although in book xxi., chap. 14, various kinds of bees'-wax are mentioned, and the method of wax-bleaching is minutely described, which, it may be remarked, somewhat resembles the process employed in the present day,—no allusion is made to the application of wax to the manufacture of candles; nor in speaking of tallow and other animal fats, and their separation from the cellular-tissue, is it stated that they were employed for candles.

From Fosbroke (*Encyc. Antiq.*, p. 472, 4to Edit.), who copiously refers to most of the best authorities elucidating this subject, the principal of which have been carefully examined for this Report, we learn that wax was employed by the classical ancients for candles; the wick was made of rope and leaves of the papyrus, and such candles were carried by children at marriages, and were used at funerals. And the same authority (p. 405) adds that their illuminations were made not only with lamps, but also with links and wax-flambeaux.‡ He states, moreover (p. 240), that the rich Romans used lamps, and the poor employed candles. Beckmann has recorded a notice that the Emperor Constantine, about the beginning of the fourth century, "caused the whole city of Constantinople to be illuminated with lamps and *wax-candles* on Christmas-Eve." (*Hist. of Inv.*, Bohn's Edit., ii. p. 174.) Apuleius distinguishes wax and tallow candles by the terms *Cerei* and *Sebacei*.

In the middle-ages, continues Fosbroke, wax-candles were made of various sizes,

* The same story is also related by Livy, lib. xl. c. 29, with the additional statement that the books were bound round in a package with *two* candles; which seems to indicate that flax formed into torches with pitch or wax, were employed, simply to hold the manuscripts together. These torches probably somewhat resembled the tarred string used for the purposes of illumination in the present time by workmen engaged at night in laying down gas or water pipes.

† The description of the Irish candles in Fosbroke's *Encyc. Ant.*, p. 240, however, throws much doubt upon this conclusion. It is there stated that they were formed like those of other nations, of peeled rushes dipped in butter or grease, and placed in *lamps of oil*. (Ledwich, *Ireland*, 1790, p. 225.)

‡ *Annal. Tacit.* lib. iii. c. 9. Edit. *Lips.*, p. 78, n. 21.

some exceedingly small, and others weighing so much as 50 lbs. ; they were made in moulds, the wicks being formed of twisted tow. He likewise states that they were made at home in gentlemen's houses. Whilst describing the architecture of the Britons, Anglo-Saxons, &c., he mentions that *tapers*, ornamented with flowers,* were used on high festivals to burn before particular images, and be borne in procession. That wax-candles were not made in the Saxon period by regular chandlers as now, appears from the description in *Asser's Annals*, translated for Bohn's *Six Old English Chronicles*, p. 84, of King Alfred's device for marking the hours of the day, by the consumption of wax-candles ; six of which, lighted in succession, burned exactly twenty-four hours. It there appears that "he commanded his chaplains to supply wax in sufficient quantity, and he caused it to be weighed in such a manner that when there was so much of it in the scales as would equal the weight of seventy-two pence, he caused the chaplains to make six candles thereof, each of equal length, so that each candle might have twelve divisions marked across it."

There can be no doubt, however, that the occupation of the wax-chandler existed in England at a very early period, as well for the manufacture of tapers for religious rites, as for the preserving of the bodies of important personages in waxed cloths, which was called *Cering* them. Hence the art was probably practised chiefly, if not exclusively, in monasteries ; the tenants of which paid several of the rents in kind, and one of these was delivered in wax, and called *Cerage*. The persons whose office it was to make this wax into paste and tapers were termed *Ceragii* and *Cerarii*, and Ducange shows them to have existed so early as A.D. 779. In 1397, John of Gaunt, Duke of Lancaster, directs by his will that his body should be carried direct to the Friars-Carmelites in Fleet Street, but that there should "be no *cering* or embalming of his corpse ;" indicating that this operation was probably even then performed by ecclesiastics. In 1495, however, a contemporaneous authority states that the Princess Elizabeth, daughter of Henry VII., "was cered by the wax-chandler." Ducange shows that *Candelarii*, or persons who made and sold candles, were known in the middle of the thirteenth century."

By the sixteenth century the trade of wax-chandler was probably extensively established in England. In Brand's *Popular Antiquities* (vol. i. p. 29, Edit. Knight), is an extract from the churchwarden's accounts of St. Martin Outwich, London, under the year 1510 :—"Paid to Randolf Merchaunt, wax-chandler, for the Pascall, the Tapers affore the Rode, the Cross candelles, and Judas candelles, ix^s. iiij^d." In the *Memoirs of the last Two Years of the Reign of Charles I.*, by Sir Thomas Herbert and others (page 128), is described the night-light used in his chamber as "a cake of wax set in a silver basin, that then, as at other times, burned all night ;" this description referring to the years 1646-1649 closely agrees with some of the forms of the modern mortar night-lights. Long coiled Wax-Tapers were manufactured in the 17th century in Venice, and the invention appears to have been brought to Paris about the middle of the same century by Pierre Blesimare, of that city.

* Some examples of wax-candles, ornamented in this manner, are exhibited in the Russian Department.

In the year 1775, the Rev. Gilbert White, in his *Natural History of Selborne*, pp. 198 and 199, 4to edit., describes the method of making Rushlights then practised by the cottagers of Hampshire, from which it might be inferred that they must have closely resembled those made by the ancients. A full abstract will be found in Tomlinson's *Cyclopædia*, p. 290, whence the following passage is taken :—"A pound of rushes (*Juncus effusus*), containing 1,600 individuals, was coated with 6 pounds of tallow, so that 228 lights weighed one pound, and cost a little over 5*d.* The rushes were peeled on three sides for the best lights, and on two only for watch-lights, which were not required to give so much light, and which, Gilbert White says, 'it is true only shed a dismal one—'darkness visible.'" Of the other kind he says, that "a good one, which measured 2 feet 4½ inches in length, burned 57 minutes;" and that he was assured by an experienced old housekeeper that 1½ lb. of rushes, after having been coated with tallow, completely supplied his family for a year. The cost of lighting with rushes he estimated at one farthing for 5½ hours, whilst a halfpenny candle in the "blowing" open rooms of the poorer cottagers only lasted 2 hours.

In the year 1799, William Bolts took out a patent in England for improving the form, quality, and use of the candle, the specification of which probably contains the first account of an attempt at the improvement of the quality of candles made from tallow and other animal fats, by subjecting the material to a considerable pressure during the act of cooling, and which, in effect, is the preparation of the so-called *Stearine* from fats. He likewise describes a solid candle with a short wick, which is placed in a holder, and kept pressed on the end of the candle by a spring, or else the candle is placed in a tube and pressed against the wick by a spiral spring; as well as other contrivances, some of which have been revived and successfully carried out in our own days.

The object of the preceding notices, incomplete as they are, is merely to enable the reader to form some idea of what may be gleaned relating to the various means of producing light at different periods, and especially regarding the construction and materials of the candle. Great interest, indeed, would be attached to a complete history of *Domestic Illumination*, tracing its gradual development from the solitary watch-lantern graven on the Pyramid, through the graceful but very imperfect lamps of the Greek and Roman period, as exhibited in our museums, and the clumsy contrivances of the middle-ages, up to the productions of modern times, satisfying the demands both of taste and science. In such a narrative might be shown the progress of light, in the literal signification of the word, by a careful examination of the various forms in which it has been at different times employed, as lamp, lantern, torch, flambeau, falot or cresset, candle, and gas; whether for the celebration of religious ceremonies, for increasing domestic comfort, adding to the security of the streets of towns, or forming a beacon to guide the mariner at night.* It would be, at the same time, a history glancing at the advancement which the improvements in illumination have given to the social condition of mankind; and at the advantages which science has derived from the study of this subject. Nor would entertainment or interest

* For a history of the "Lighting of Streets," the reader is referred to *Beckmann's Hist. Inv.* (Bohn, vol. ii., p. 172.)

be wanting in the recital of the many superstitions connected with the burning of lamps and candles; the shape of whose flame, trembling in the moving air, and whose wick, bending or spreading under the influence of heat, has been suggestive to human imagination from the time of Pliny up to the enlightened days of our own century. Such an inquiry, however, even were it possible with the time and the materials which are at the disposal of the Reporters, would far exceed the limits assigned to this Report. The same restriction as to space prevents them from following step by step all the various mechanical contrivances which have been invented in recent times to facilitate both the manufacture and combustion of candles. The Reporters cannot, however, refrain from entering into some details regarding the remarkable chemical improvements which have occurred within the last thirty years; especially since they possess the additional interest of being the result of investigations of a purely scientific character, undertaken without any view to their ultimate practical application. In the present day it is too much the custom to require an instantaneous practical result, much to the detriment of the persevering prosecution of abstract science: the numerous, brilliant, and continually occurring proofs of that most important truth are too often overlooked, that all truly scientific studies tend to increase, sooner or later, not only the intellectual, but also the physical wealth of nations; and materially benefit the world at large.

(a.)—*Tallow-Candles.*

The ordinary tallow-candle labours under many disadvantages, which are so well known that they scarcely require to be specified. It has an unpleasant odour, which becomes more marked whilst burning; and the attempts at supplying it with a self-consuming wick have been only partially successful on account of the low fusing-point of the tallow. The slightest draught, from the same reason, causes the tallow to melt in larger quantity than can be consumed by the burning wick, and it therefore gutters down; this renders the tallow-candle ill adapted for being carried about a house, as grease spots are apt to be produced which are very difficult of removal;* to which we may add that it cannot be handled without soiling the fingers.

The disagreeable smell of tallow-candles arises chiefly from the tallow being imperfectly purified; for if it contain a portion of the cellular tissue of the fat from which it is obtained, this putrifies and communicates the process of decomposition, like a ferment, to the fatty matter, which becomes rancid and evolves a most unpleasant odour. This is always the case with tallow as it occurs in commerce, which, although fit for the soap-boiler, is too impure to be employed by the candle-maker without clarification. The first step towards the improvement of tallow-candles was made in the recognition of this fact; more attention was in consequence bestowed upon the manner of purifying or "*Rendering*" the tallow, as it is called. In England the "*rendering*" is effected by melting the tallow in an open copper pan exposed to the direct action of the fire. After it has remained

* Common ether is one of the best vehicles for the dissolution and removal of oil or grease spots.

in a fused state for some time, the water which the fleshy particles contain evaporates, and they then rise to the surface and are skimmed off and pressed. The pressed cake is called "greaves," or "cracklings," and is used for feeding dogs. On the Continent, however, D'Arcet's method is now universally employed, which has also been adopted in Ireland: it consists in treating the raw tallow melted by steam-heat with very diluted sulphuric acid, for the purpose of destroying the cellular tissue. This method, besides being much safer, yields three per cent. more tallow than the older process; and though it does not entirely remove the smell, essentially improves it. The purification of the tallow at the same time induces an amelioration in the flame of the candle, more particularly in point of uniformity in the development of light; as the cause of the frequent obstruction of the wick during combustion by less combustible nitrogenous substances is removed.

Less success has attended the attempts to supersede snuffers, which still continue a necessary appendage to a candlestick with a tallow-candle. The plaited wick which, as we shall see farther on, followed in the wake of stearic candles, is not applicable to the tallow-candle without some special contrivance, as in curling over outside the flame (by which it becomes consumed) it causes the tallow to melt in such large quantities that a considerable guttering is the consequence. It is therefore necessary to protect the candle if a self-snuffing wick be employed; this is effected in Palmer's lamp. Here the candle is enclosed in a vertical metallic cylinder with a cap whose orifice is smaller than the candle; as the candle is consumed a spiral spring presses it upwards against the cap. This contrivance much resembles the plan proposed by W. Bolts in 1799, to which allusion has already been made.

The next improvement in the tallow-candle was effected by a reduction of the fusibility of the materials employed. This was first done by the same inventor, W. Bolts, but received farther development from Chevreul's researches. The observations of this celebrated chemist, to which we have already alluded in our article on soap, showed that all varieties of solid fats might be split into a solid crystalline fat (stearin and margarin) and an oily liquid (olein);* in his laboratory-experiments this separation was effected by means of solvents; but subsequently it was found that by attending to the *temperature* of the fat, it might for all practical purposes be produced equally well by pressure. Common tallow melts at between 37°-40° C. (99°-104° F.) The melting-point of stearin is 62° C. (144° F.) By removing a considerable portion of the olein from the tallow, its fusing-point was consequently raised, and thus a great evil removed. Candles have been repeatedly made of pressed tallow; they fairly deserve to be called stearin-candles, while those that now go by that name actually do not merit the appellation.

To prepare stearin tallow is melted and allowed to cool as gradually as possible, with constant agitation, so that the stearin and margarin may crystallize; at from 35° to 38° C. (95° to 100° F.) the mass becomes pasty, and is subjected to slow pressure in cloths. By repeating the operation, the stearin is obtained gradually of greater purity.

* The American Section contains several specimens of Olein obtained by pressing lard, which, under the commercial name of lard-oil, is exhibited at Nos. 18, 19, 208, 562.

Cocoa-nut-stearin is very largely employed in England to mix with stearic acid, to form composite candles, the neutral fat appearing to be better adapted for this purpose than the fat-acids which may be prepared from it; but on the Continent it is but little used.

As regards the employment of tallow-stearin, many obstacles have stood in the way of its development which might, there is little doubt, have been removed by persevering investigations, had not the more careful researches into the nature of the process of saponification of fats, and the separation of solid acids from the fatty bodies, the result of these researches, directed the inquiry into a new channel. When it was found that stearic acid fusing at 70° C. (158° F.) could be obtained from stearin fusing at 62° C. (144° F.), and margaric acid with a melting-point of 60° C. (140° F.) from margarin fusing at 47° C. (117° F.), while the oleic acid remained as fluid as the olein from which it was derived, it became evident that the difference in the fusing-points of the solid and liquid acids being so much greater, the separation of the former from the latter might be effected without difficulty. Thus the transition of the tallow-candle to the stearic candle was effected.

Tallow-candles are of two kinds, "dips" and "moulds." Dips are made by dipping the wick repeatedly in melted tallow; allowing a sufficient time to elapse between every operation, in order that each coat may consolidate.

Mould candles are usually made in pewter moulds, although glass moulds have been lately introduced. The mould consists of two parts, a cylinder and a conical cap, which is perforated to allow a passage for the wick. Several of these moulds are fixed in a wooden frame, the upper part being formed like a trough in which the open end of the mould is inserted, the capped end pointing downwards. To insert the wick, the frame is laid on its side, and a long wire with a hook at one end is passed through the hole in the cap; the wick is then attached to the hook by means of a loop which is formed in it; on pulling back the hook, the wick is drawn with it. A wire is now inserted across the top of the mould and through a loop at the other end of the wick; lastly the wick is drawn tight through the cap, and a small wedge of wood is inserted to keep it in its place. The moulds are filled by running the melted tallow into the trough, and are then allowed to cool until the next day.

There have been several improvements of late years in the mechanical arrangements for the manufacture of tallow-candles, which it would be difficult to describe clearly without engravings; these have tended much to lessen their cost, and consequently the consumption continues very considerable; still it may be expected, notwithstanding their moderate price, that they will be gradually superseded by the more elegant and harder candles of stearic acid, or of compounds of stearic acid with solid neutral fats, which have the advantage of being self-snuffing. As yet the general introduction of stearic candles is impeded by their price; but we may confidently hope that the progress of science will soon afford us the means of still farther reducing their cost of production, and thus render the use of the tallow-candle less frequent in the dwellings of the poorer classes of society, as it has already disappeared from the homes of the middle classes.

It is remarkable that the ordinary tallow-dip candle is not exhibited by any

nation whatever, although there must exist far more makers of this kind than of any other.

AUSTRIA.

This is the only foreign country which has contributed tallow mould-candles. They are sold at 19 kreuzers per Austrian, or $5\frac{1}{2}d.$ per English pound; which is a halfpenny more than that at which far superior candles may be bought for in Ireland.

BRITISH COLONIES.

Two colonies, namely *Nova Scotia* and *Van Diemen's Land*, have sent mould candles, in which there is, however, nothing remarkable.

UNITED KINGDOM.

The manufacture of tallow-candles in the United Kingdom still continues to be a most extensive trade, notwithstanding the increasing consumption of gas, and the introduction of stearic and composite candles. Prior to 1831, when the duty on candles was repealed, they yielded an important revenue in Great Britain, as may be seen from the following statement. The duty, it may be remarked, was first imposed in 1803, and continued at the same rates from that period until 1831, viz., $1d.$ per pound on tallow, and $3\frac{1}{2}d.$ per pound on wax or spermaceti candles. It did not extend to Ireland.

M'Culloch's Dictionary of Commerce, p. 228.

Years.	Tallow. lbs.	Duty. Per lb.	Wax. lbs.	Duty. Per lb.	Spermaceti. lbs.	Duty. Per lb.	Net Revenue.		
							£.	s.	d.
1820	88,352,461	$1d.$	692,705	$3\frac{1}{2}d.$	193,463	$3\frac{1}{2}d.$	373,455	14	5
1821	93,816,346	"	697,196	"	165,647	"	395,911	8	7
1822	98,311,801	"	682,241	"	179,208	"	415,609	15	3
1823	102,461,879	"	694,194	"	180,401	"	433,537	15	8
1824	109,810,900	"	759,751	"	179,454	"	466,042	16	1
1825	114,187,550	"	851,370	"	208,377	"	485,014	8	9
1826	110,102,643	"	705,615	"	201,790	"	467,069	12	1
1827	114,939,578	"	713,655	"	226,277	"	487,318	3	4
1828	117,342,157	"	748,293	"	270,263	"	497,770	2	9
1829	115,156,808	"	746,052	"	303,683	"	489,059	1	9

In 1830 the number of candle-makers in Great Britain was 2,695, who paid 500,048*l.* 14*s.* $1d.$ duty; since the repeal of the duty no record has been kept of their number, but judging from the tallow imported, it cannot be less than in 1830.

Quantity of tallow entered for home-consumption in the United Kingdom in the last ten years:—

Years.	Cwts.	Years.	Cwts.
1841	1,241,278	1846	1,183,834
1842	1,030,960	1847	1,069,301
1843	1,174,945	1848	1,406,725
1844	1,081,039	1849	1,412,484
1845	1,191,896	1850	1,219,101

Detailed report of the Imports of Tallow into the United Kingdom in 1850 :—

Tallow Imported from—	Cwts.	Duty paid. £.
Russia - - - - -	803,697	60,278
British Settlements in Australia - -	179,567	752
United States of America - - -	32,523	2,439
South America - - - - -	184,321	13,824
Other parts - - - - -	18,993	977
Total - - - - -	<u>1,219,101</u>	<u>78,270</u>

Of Tallow-candles only 1,067 lbs. were imported in the same year.

In 1830 the quantity of Tallow Imported into the United Kingdom was 1,073,833 cwts.

There are Four Exhibitors of mould-candles, two English and two from Dublin. The Irish candles only are deserving of notice, and may be regarded as the perfection of tallow-candles; indeed it appears that the makers of Dublin have acquired a high reputation for mould-candles, by bestowing great care on the purification of their tallow and on the moulding.

The price of tallow-mould-candles is 5*d.* per lb.; those with waxed wicks, 5½*d.*; and the composite candles, formed of tallow and cocoa-nut-stearin, 8*d.* per lb.

(b.)—*Stearic Candles.*

With this term we designate the candles made from the isolated solid fatty acids in contradistinction to those consisting of pressed tallow or lard (stearin), although in commerce, both are called “stearine candles.” The manufacture of stearin-candles is on the decrease, and tallow is now very rarely pressed. The stearin from cocoa-nut-oil (cocin) is, however, still prepared in considerable quantities, and mixed with stearic acid, and manufactured into the numerous kinds of composite candles which are so generally used in England. Compared with other fats, the importation of cocoa-nut-oil is not large; the following is the detailed account for 1850, from which it will be seen that by far the largest quantity comes from India :—

Cocoa-nut-oil imported from—	Cocoa-nut-Oil imported into the United Kingdom in 1850. Cwts.
British Possessions in India - - -	85,096
British Settlements in Australia - -	6,315
Other Parts - - - - -	6,628
Total - - - - -	<u>98,039</u>
	Duty free.

The foundation upon which the manufacture of stearic acid candles is based is the saponification of fats, and the separation of the fatty acids from the soaps, which the beautiful researches of Chevreul have made known to us. It would, however, be an error to suppose that these investigations alone solved the difficulty. Seven years, in fact, elapsed after the publication of Chevreul’s discoveries, before they were successfully applied; but this can be a matter of no surprise to those familiar with the establishment of a new industry, and who are aware of the immense chasm which separates the laboratory of the chemist from the work-

shop of the manufacturer : they only can comprehend fully the obstacles of all kinds that must be vanquished, in order to fructify a purely scientific germ, and render it a healthy and vigorous branch of art.

The first steps in the manufacture of stearic candles were surrounded by difficulties of all kinds which frequently clouded the prospects of the enterprising inventors. Chevreul's experiments were published as early as 1823 ; but the idea of making candles from the isolated fatty acids does not appear to have been matured until two years later. At this period Chevreul allied himself with his celebrated colleague Gay-Lussac, with the intention of applying his discoveries to the practical purposes of life. In the year 1825 these two chemists took out a patent in France for the manufacture of fatty acids, and their application to the making of candles. Gay-Lussac took out, moreover, a patent in England, in the name of his agent Moses Poole, on the 9th of June of the same year. The specification of these patents is highly interesting as evincing a remarkable sagacity on the part of the patentees in anticipating the progress of this branch of industry ; they call in aid all the agents which have been adopted up to the present day, even including the distillation of fatty acids with the aid of steam, which has only been brought into practical operation within the last ten years. Nevertheless the proprietors of the patents derived no benefit from them. The processes which they employed resembled too closely the proceedings of the chemist in his laboratory, rendering their industrial execution too costly. Although lime was specified by Gay-Lussac for the saponification of the fat, the ordinary alkalies continued to be employed ; and for decomposing the soap, hydrochloric acid was used, the alkaline salts of which were never completely separable from the fatty acids. In their French patent, Chevreul and Gay-Lussac even spoke of the necessity of cold and hot alcohol for the perfect purification of the stearo-margaric acid. If we compare this proceeding with the present practice, we perceive that it had yet to pass through various ordeals.

A formidable and unforeseen difficulty presented itself in the fact that the new stearic candles would not burn with the ordinary wick ; a long series of experiments were necessary in order to construct a wick which would not sputter the fat during its combustion. Chevreul and Gay-Lussac succeeded in doing this in the course of 1825, and indeed the plan was specified in the English patent before spoken of ; they endeavoured to secure their invention in France by a rider to their patent, but this was not done until another inventor had taken out a patent for a similar contrivance.

A discovery like the separation of the fatty acids necessarily excited in many minds the desire for its practical application. Almost immediately after the publication of Chevreul's work, Cambacérès, an *Ingénieur des Ponts et Chaussées*, appears to have directed his attention to the utilization of Chevreul's investigations ; at all events he took out a *brevet* for the improvement of the wicks of stearic candles in February 1825, which was prior to the date of the rider to Chevreul and Gay-Lussac's patent in France, and that of Gay-Lussac's in England ; the value of the patents of these chemists was, therefore, considerably reduced. Cambacérès' first plan was a hollow wick, but in May of the same year he patented the plaited and twisted wicks, by which snuffers were rendered superfluous. The tension of the separate threads of the plaited wick causes the portion which rises

from the candle to curl outwards, so that its point projects beyond the flame, and is rapidly consumed in the air that plays freely around it.

Cambacérès had observed that the wicks soon became clogged in the stearic candles, although this did not happen if they were used in ordinary tallow-candles; he ascribed this phenomenon to the formation of soaps produced by the action of the fatty acids on the carbonated alkali resulting from the combustion of the wick. Whatever may be the cause, he succeeded in removing the difficulty by treating the wick with dilute sulphuric acid: he supposed that the presence of this acid prevented the formation of soaps by combining with the alkalies in the ash to form sulphates.

Another essential improvement in this branch of industry was brought about by the introduction of the cheaper material, lime, as a saponifying agent, followed up by the decomposition of the lime-soap by dilute sulphuric acid. The merit of having *successfully* introduced the saponification by lime (*saponification calcaire*) belongs to De Milly, who has earned great praise by his contributions to the stearic manufacture. His plan formed part of the original patent of Chevreul and Gay-Lussac, and it redounds much to his credit that he brought a plan to bear which had failed in the hands of his illustrious predecessors. The saponification by lime, in an industrial sense, dates from 1831.

As the wicks were frequently corroded by the sulphuric acid used according to Cambacérès' preparation, De Milly, in 1836, took out a patent for employing the borate, phosphate, or sulphate of ammonia, for the same purpose. These improvements, and the endeavours of De Milly to promote the introduction of the new branch of industry in other countries, gradually caused its extension.

Nevertheless numerous difficulties still remained to be overcome. The limits of the present sketch will not permit us to do more than give the main features of the development of the stearic manufacture: we are unable, consequently, to trace year by year all the little improvements which have taken place; but we cannot avoid a short notice of the numerous experiments necessary to prevent the crystallization of the stearic acid during the moulding of the candles. The first attempt made was to introduce another acid; and though successful in its immediate object, the choice (arsenious acid) was an unhappy one, for it almost threatened the very existence of the youthful art. It is true that this deleterious substance was added in very minute quantities, yet it was entirely incompatible with health, and was soon prohibited on the Continent by authority, and in England by equally powerful public opinion. Here commenced all the manufacturer's troubles anew; in all directions he sought a substitute, and yet found none; at last, after innumerable experiments, and when almost driven to despair, he hit on two expedients—very simple when once found out—which answered as perfectly as the discarded plan. The means now employed are—the addition of a very minute quantity of wax to the stearic acid: a still more common plan is to allow the melted acid to cool down almost to the point of congelation before it is poured into the moulds, which are warmed to the same temperature as the fatty acids. The refrigeration and occasional stirring of the liquid fat produces a sort of liquid pulp which congeals in the moulds without crystallization.

Sulphuric saponification (saponification sulfurique).—While the stearic manufacture was gaining ground extensively, as we have indicated, a new art

sprang up during the last ten years, having the same objects, and being based on the same foundations, but seeking the attainment of the goal by entirely different means—we speak of the saponification of fat by means of concentrated sulphuric acid, and subsequent distillation of the resulting fatty acids.

The origin of this proceeding must undoubtedly be sought in Chevreul's work; still E. Frémy deserves the credit of having, in an important paper, perspicuously exhibited the relations of fats to sulphuric acid. He demonstrated, in a treatise which he published in 1836, that the action of powerful acids on fatty substances has a close analogy to that of the alkalies. Both reagents decompose the fat, but while the alkalies combine with the fats and set the glycerin free, the sulphuric acid combines both with the acids and the glycerin; thus we obtain conjugate sulpho-acids, sulpho-stearic, sulpho-margaric, and sulpho-oleic acids, on the one hand, and on the other sulpho-glyceric acid. The first three are of a very ephemeral character; water decomposes them into slightly modified fatty acids insoluble in water, and sulphuric acid, which, with the sulpho-glyceric acid, dissolves in the water.

To George Gwynne is due the merit of having first described a method of obtaining fatty acids by the sulphuric saponification of neutral fats, and subsequent distillation of the resulting products. In a patent obtained in March 1840, he describes very fully his proposed plan for effecting this object, which consisted in distilling *in vacuo* by means of an apparatus similar to that employed in sugar-refining; the difficulty of sustaining a good vacuum on the large scale was, however, found to present so many obstacles that the plan was subsequently abandoned. Mr. Gwynne proposed also to distil, in the same manner, fatty acids obtained by means of lime-saponification, and even to obtain fatty acids by the distillation of neutral fats.

George Clark also directed his attention to the practical application of Frémy's experiments. On the 5th November 1840, he took out a patent for utilizing the property of sulphuric acid in decomposing fats, but without having recourse to their subsequent distillation; the difficulty and cost, however, of purifying the fat after decomposition rendered the attempt unsuccessful, notwithstanding that the quantity of sulphuric acid proposed to be used was only one-fourth the weight of the fat, whilst Frémy employed, in his laboratory-experiments, double this quantity.

Farther experiments were still necessary to establish, on a firm footing, saponification by means of sulphuric acid, which ultimately again led to the adoption of an improved system of distillation. In the patent before mentioned, which Gay-Lussac took out in England, and which is distinguished by its comprehensive treatment of the question, the distillation of fatty matters is spoken of, and the remark incidentally made, that the process is much accelerated by the presence of moisture; this part of the specification was, however, never worked. Nearly sixteen years later, on the 22nd August 1841, Dubrunfaut obtained a patent in England, and about the same time likewise one in France, for the purification of fatty bodies and their distillation. The plan proposed by M. Dubrunfaut was to heat the commoner oils to a high temperature, and to pass steam through them, by which means their disagreeable odorous principle was intended to be removed. The distillation of fatty bodies was also claimed by Dubrunfaut, but the chief object of his patent was evidently the purification of

common oils. By decomposing the neutral fatty bodies in this way, acrolein is produced, the vapour of which is so pungent and irritating, both to the eyes and the throat, that no workman can be found to endure it; hence this patent was not successfully worked, yet it contained a germ, which, in the hands of Jones, Wilson, and Gwynne, was elaborated into the art now practised.

In an English patent, dated the 8th December 1842, and granted to William Coley Jones and George Wilson, we find the first application of the combined process of sulphuric saponification and *steam*-distillation. They decompose fats with sulphuric acid, aided by heat, and distil the fat thus decomposed by means of steam, which passes in minute streams out of a perforated coil fixed in the bottom of the still.

This combination of the sulphuric saponification and subsequent distillation solved the fundamental conditions of success; nevertheless a whole series of improvements followed, which essentially contributed to establish the present extension of this system of manufacture.

Patents taken out by Gwynne and Wilson, on the 16th November 1843, and on the 28th December of the same year, secured to them farther improvements in this process; in the latter a method is described of reducing the quantity of sulphuric acid employed for decomposing the fats to from 10 lbs. to 6 lbs. for every 112 lbs. of fat, that is to one-sixth, and even to one-tenth of the quantity employed by Frémy in his investigations. This saving was effected by heating the fat to 177° C. (350° F.) Another improvement was the heating of the steam in a series of pipes after it had left the boiler, instead of depending on the temperature of the fat to effect it.

Their last patent on the subject is that of the 30th October 1844, in which they propose to use a jet of super-saturated steam* to heat the fats previous to sulphuric saponification. These patents embody all the plans which, since July 1844, have been in operation at the works of Price's Candle Company at Vauxhall and Battersea, of which Mr. Wilson is the managing director.

Similar manufactories, though not of such magnitude, have been established in other countries; the principal works are those of Masse and Tribouillet at Neuilly, near Paris, Motard in Berlin, Bert at Gijon (Spain), and of the Milly Candle Society in Vienna.

There can be but little doubt, after inspection of the candles in the Exhibition, that the process just described is applicable to the production of the higher class of candle, white, inodorous, and dry to the touch; but this is not the only part which it has filled up to the present time, it is in the treatment of palm-oil and cheap fatty bodies that it renders most valuable service. By its aid, fats the most fetid and impure furnish candles of the finest quality; and thus it utilizes the waste of the glue-maker, and oily residues derived from the waste lyes of woollen and other manufactories.

We now proceed to describe the practical processes of the workshop, the various stages of which will be followed without difficulty after what has been said in the article on soap, and in the foregoing sketch respecting the constitution of fats and their decomposition.

* Steam heated to a higher temperature, after it has left the boiler, than it can acquire if kept in contact with the water from which it is generated at any given pressure.

(c.)—*Description of the Lime Process as practised at Messrs. Ogleby & Co.'s Works at Lambeth.*

Saponification.—Into a large wooden vat, containing a coil of steam-pipes, pierced with small holes, ten tons of tallow are placed, with a quantity of water. The steam, when turned on, issues through the holes into the water, raises its temperature, and melts the tallow; as soon as the water has entered into brisk ebullition, a quantity of lime, in the state of thin cream, is added, and the ebullition continued for six hours, or until complete saponification is effected. From 10 to 15 parts of dry quick-lime are added for every 100 parts of tallow. The lime decomposes the tallow and combines with the resulting stearic, margaric and oleic acids, forming a lime-soap (rock soap), and sets the oxide of glyceryl at liberty in its hydrated state as glycerin which dissolves in the water. The whole is allowed to cool in the vessel in which the boiling is effected, and the solution of glycerin run off.*

The rock-soap, when cold, is reduced to a coarse powder by a mill, consisting of a pair of fluted rollers, over which an axis is placed, carrying tiger-like claws, which revolve between a series of horizontal prongs. The claws, by passing between the prongs, tear the large lumps into small pieces, which are then crushed by the fluted rollers.

Decomposition of the Lime-soap by Acid.—The ground lime-soap is now placed in lead-lined vats, supplied with a perforated copper steam-coil, each vat being capable of holding from eight to ten tons. When the temperature has reached the boiling-point, sulphuric acid, previously diluted, is added in the proportion of about 25 parts to every 100 parts of tallow employed. The sulphuric acid combines with the lime, forming an insoluble sulphate of lime, and liberates the oily acids which float at the top, and are then termed "yellow matter." This yellow matter is run off by cocks, placed at the proper level, into large spouted vessels, called "jacks," and poured from these into flat tin-moulds, in which it is allowed to cool and crystallize.

The sulphate of lime, after being well washed with boiling acidulated water to remove the adhering fat, is sold as manure.

Pressing the Fatty Acids to remove the Oleic Acid.—The cakes of yellow matter are interleaved with cocoa-nut mats (without being sliced and enclosed in bags, as was formerly the case), and subjected between iron-plates to a pressure of 600 tons in a vertical hydraulic press. A great portion of the oleic acid is thus removed, and the mixture of stearic and margaric acids rendered much whiter.

Refining.—The cold-pressed acids are then melted by steam in a lead-lined wooden vat, with a little dilute sulphuric acid, to remove any oxide of iron, or other impurity; poured into flat tin trays, and again allowed to cool and crystallize.

Hot-pressing.—The cakes of stearic acid, when cold, are put separately into a linen-bag, interleaved with cocoa-nut matting and iron plates, previously heated by steam, placed in the trough of a horizontal hydraulic press, which is likewise

* Until within the last four years the glycerin was a valueless product; its utilization is due to Mr. Thomas De La Rue, who, being engaged in experiments on its application in the arts, happened to observe its property of alleviating any irritation of the skin, and suggested to a medical friend its use in the treatment of cutaneous affections.

heated by steam, and then subjected to great pressure for some time. By this operation the remainder of the oleic acid, holding a little of the solid acid in solution, is removed. The pressed cakes retain a small quantity of oleic acid at the edges; these are scraped off, melted, and again pressed.

Second Refining.—This process is simply a repetition of the first process of refining.

Moulding.—In the manufacture of the best description of stearic candles, the moulding is generally performed by hand. The moulds are of pewter, several being fixed in a wooden frame; these moulds are heated to a temperature approaching the fusing-point of the stearic acid, and are rapidly wicked, in the manner already described in speaking of tallow mould candles.

The wicks are all previously prepared by immersion in a solution of boracic acid, or the ammonia-salts of this and other acids, the preparation varying with the experience of different manufacturers. This preparation, called flux, serves to fuse the ashes of the wick into minute globules, which are frequently seen on the extremity of the wick, and which are readily dispersed, and also prevents the formation of earthy and alkaline soaps.

The melted material having been allowed to congeal to a great extent, is run into the moulds. After cooling, the candles shrink sufficiently to be removed with a few light taps on the frame.

The fusing-points of stearic candles are remarkably uniform, though manufactured by various makers in different countries; for example, those taken from Messrs. Ogleby's case congealed at $55^{\circ}25$ C. ($131^{\circ}5$ F.), and one from De Milly's at $55^{\circ}50$ C. (132° F.) This coincidence is very remarkable. Stearic acid fuses at 70° C. (158° F.); margaric acid at 60° C. (140° F.) So that from the mixture of the two a compound is formed which fuses at a lower degree than either of the components, for it is almost impossible to assume that the solid acid should still contain a sufficient quantity of oleic acid to reduce its fusing-point to such an extent.

(d.)—Description of the Sulphuric Saponification and Distillation Process employed at the Works of Price's Patent Candle Company.

Sulphuric Saponification.—About 20 tons of fat, say palm oil, are placed in a large lead-lined vat, and fused by a steam-jet. The fluid mass, after being allowed to settle, has now to be exposed to the combined action of concentrated sulphuric acid and heat, and for this purpose is pumped up into the acidifying vessel, in which its temperature is raised to 177° C. (350° F.) The means of heating is a jet of low-pressure-steam, which, in its course from the boiler, passes through a series of iron pipes heated in a furnace. The quantity of acid used is in the proportion of 6 lbs. for 112 lbs. of palm-oil. In this operation the palm-oil is decomposed and becomes much blackened. Withdrawn at that period it is seen that an important change has been effected by the action of the acid, as the mass now readily crystallizes to a tolerably solid fat. The fat is now drawn off from the acid and transferred to the washing tank, where it is boiled up with water by means of a steam-jet.

Distillation.—After one or two washings the blackened fat is withdrawn and

pumped up to the supply tank, which commands the stills. The stills, which are made of copper, are heated by an open grate; each still is capable of holding five tons of fat. When charged, the temperature is raised to $293^{\circ}\cdot5$ C. (560° F.), and low-pressure-steam passed through the mass; this steam is previously heated by passing through a system of iron pipes placed in a furnace.

The current of steam carries with it the vapour of the fatty acids, and thus facilitates the process. The mixed vapours of fatty acids and water pass together to a series of vertical pipes, which retain a temperature above 100° C. (212° F.), where the fats only condense while the steam passes to a second refrigerator, cooled by a current of water; here it is condensed along with the minute quantity of fat carried over by it. A separating tank, from which the water escapes at the bottom, whilst the fats float on the top, serves to recover this small quantity.

Distillation of the Residue.—After continuing the distillation for a certain period, the residue in the still is transferred to another still formed of iron pipes, set in a furnace, and there submitted to a much higher temperature, and a jet of steam more strongly heated. The residue left in these iron stills is a sort of pitch, and is applied to the same uses as ordinary pitch; by this means an additional quantity of fatty acids is obtained.

The fatty acids, as they run from the still, are used, to a great extent, for the manufacture of candles without pressing, and form what are called Composite candles, which possess all the advantages of being self-snuffing, but are more fusible and softer than the pressed stearic acid candles.

A large proportion of the distilled fats, however, is pressed to make a better sort of candle, and for this purpose 50 hydraulic presses are employed.

Cold Pressing.—The fats are spread by ingenious machinery on woven mats, and submitted to powerful cold pressure, between iron-plates; the oleic, or metoleic acid, runs out, and is collected, and chiefly exported to Germany, where it is employed in soap-making.

Hot Pressing.—After cold-pressing, the fat acids are subjected to hot pressure, in hydraulic presses, confined in a chamber heated by steam. The pressed cakes, after the removal of the edges, are melted in contact with a little diluted sulphuric acid, and run into blocks. When the Reporters visited the works, the Company were distilling at the rate of 130 tons of palm-oil per week.

Moulding.—The moulding of the cheaper descriptions of candles is effected by ingenious machinery invented by Mr. Morgan, of Manchester, and improved by the engineer of the Company. By this machine 18 candles are moulded at one time; the wicks, 60 yards long, are wound on 18 separate reels, one for each mould. As one set of candles is pushed out by a series of plungers, they draw with them into the moulds the wicks for the next lot; these wicks being held temporarily with one clip, whilst the candles are held with another, are cut off close to the candles by a traversing circular cutter. Compound forceps, having 18 holders, now seize the wicks at the open end of the moulds, and hold them in their places; the plungers then return and draw the wick tight. The moulds, which during the operation have remained in a horizontal position, are now turned in a vertical direction, the small end downwards, and are then passed on a railway, to the person who is to fill them, they being

heated to the proper temperature by their transit through a hot closet. They are then passed to other parallel railways and left to cool: after remaining a sufficient time to allow of the solidification of the candles, the moulds are brought back in succession by means of turn-tables to their first position. The forceps (which during the moulding have remained *in situ*) are now removed, and the frame of moulds again turned in a horizontal position. Eighteen plungers or pistons are made to press forward the loose bottoms of the moulds which correspond to the small end of the candle. In pushing these forward the candles are pressed out, and thus the cycle of operations is completed. It must be added that the return-stroke of the piston brings back the bottoms of the moulds against shoulders provided to keep them from falling out.

Pressed cocoa-nut-oil is largely employed to mix with the pressed acids of palm-oil to make the best composite candles.

Price's Candle Company is the most colossal establishment in the world in this branch of chemical manufacture: possessed of five distinct manufactories, besides plantations of cocoa-nut trees in Ceylon, of a capital but little short of half a million sterling, and employing, notwithstanding the best arrangements for economising labour, 800 workpeople, it is not surprising that they divide annually in profits a sum equal to the gross returns of some of the largest continental works (between 40,000*l.* and 50,000*l.*).

The fusing-point of Price's Candle Company's candles of pressed distilled fats obtained by distilling palm-oil is $51^{\circ}\cdot3$ C. (124° F.); those prepared from the pressed fats obtained by distilling Chinese tallow (derived from the *Stillingia sebifera*), according to a patent taken out on the 20th of December 1845, by Wilson, Gwynne, and Wilson, fuse at $57^{\circ}\cdot7$ C. (136° F.)

AUSTRIA.

In the Austrian Department there are Four Exhibitors of stearic candles, whose productions are generally of the highest character: the two principal are, firstly, the APOLLO COMPANY, which is the largest establishment in that country; having two manufactories, and employing about 600 workmen. These works produce about 1,000 tons of stearic candles, and 1,500 tons of soap, annually. The stearic candles of this Company are the whitest in the Austrian Section. Secondly, the MILLY CANDLE SOCIETY, which was established in 1837, with the aid of M. de Milly, who instructed his brother in the art, and sent him to Vienna for that purpose. They have two manufactories, giving work to 200 people; they also employ machinery for moulding. In the one they produce, by the lime-process, 300 tons of candles and 450 tons of soap annually; in the other, they employ the distillation-process, and produce, by distilling palm-oil, 300 tons of candles; in all, 600 tons of candles annually.

According to Mr. Buschek, the total annual value of the stearic manufactures in Austria is between 5,000,000 and 6,000,000 florins (428,572*l.* to 514,286*l.*); this includes the soap made as a secondary product from the oleic acid. Tallow costs 29*s.* per English cwt., and is reckoned to produce 45 per cent. of stearic acid, and 45 per cent. of oleic acid. Stearic acid sells at 66*s.* 3*d.* per cwt., and the manufactured candles at 112*s.* per cwt., which is an extraordinary advance on

the price of the acid. Oleic acid sells at 18s. per cwt., and oleic acid-soda-soap at 25s. per cwt.

BELGIUM.

The manufacture of stearic candles was introduced into this country by De Milly, in 1833, and has since attained a high state of excellence.

The manufactory of C. and J. QUANONNE (who exhibit) was established with his aid; and they have adopted his name, of *Bougies de l'Étoile*, for their candles. They have six hydraulic presses, and produce annually about 240 tons of stearic candles, 70 tons of which are exported.

There are Two other Exhibitors of candles from Belgium, viz.:—DELSTANCHE and LEROY, who employ 17 workmen, and produce 80 tons of stearic candles, 30 tons of which are exported; and CHARLES VAN CAMPENHOUDT and Co., whose manufactory was only established in April 1850; they, nevertheless, have sent the finest specimens. At present they are producing at the rate of about 90 tons per annum.

The wholesale price of stearic candles is from 10d. to 1s. per lb.

CANADA.

The stearic candle manufacture has extended to Canada, which contributes the productions of a single manufactory: from what has been sent, it is fair to anticipate that this art will soon be perfected.

DENMARK.

There is only one Exhibitor of stearic candles in the Danish Department; his productions are very high in price (1s. 4½d. per lb.), a natural consequence of the high protective duty of 27s. 6d. per cwt. on candles imported. At present, Mr. HOLMBLAD'S works are on a very small scale, producing only 20 tons of candles per annum. There are, however, two other manufactories established near Copenhagen.

FRANCE.

As the stearic manufacture was originated in this country, it was to be expected that there would be many Exhibitors representing this art, and that their productions would be of the finest quality, an anticipation which is confirmed by the result, for there are Six Exhibitors of stearic candles by the lime-process, and one of stearic candles by the sulphuric process, most of whom have been rewarded. There is likewise One Exhibitor of ornamented candles, which are, however, unimportant. M. de Milly, who was the first to apply the lime-process successfully, established his manufactory of stearic candles in Paris in 1831, and gave the name of *Bougies de l'Étoile* to his products, because it was situated near the *Barrière* bearing that name; his manufactory now produces, on the average, 2 tons of candles per day. Since that period many other makers have sprung up in France; and there are now in Paris and its environs six makers, besides De Milly, who collectively produce, at the least, 10 tons per

day by the lime-process; besides which there are in the French provinces, Seventeen other manufacturers, who make collectively about 17 tons per day. These figures must only be taken as approximations; but they show, that in France alone, at least 7,400 tons of stearic candles are produced by the lime-saponification process. Besides these, MASSE and TRIBOUILLET, who employ the processes of sulphuric saponification and distillation, are mounted to distil about four tons of fat per day. They have exhibited a series of most interesting products, which are described in the list of Awards.

According to a statement furnished by MASSE and TRIBOUILLET, the wholesale prices of their various stearic manufactures are as follow:—The best stearic candles, 11*d.* per lb.; second quality, 10*d.*; third quality, 9*d.*; candles made from unpressed distilled fat acids (composite candles) 7½*d.*, 8¼*d.*, and 9*d.* per lb. according to quality; grease recovered from waste suds, 2*d.* per lb.; oleic acid, 3½*d.* per lb.; oleic acid-soda-soap, 3½*d.* per lb.; and, lastly, paraffin-candles, 1*s.* 8*d.* per lb.; but it does not appear that they have yet been supplied in the way of trade.

Candles exported from France in 1850:—

	lbs.	valued at	£.
Tallow-candles - -	1,133,590		28,792
Stearic-candles - -	1,777,086	„	84,000
Wax-candles (yellow) -	3,925	„	256
„ „ (bleached)	113,227	„	10,334
Spermaceti-candles -	10,418	„	1,096
All kinds - -	<u>3,038,246</u>	„	<u>124,478</u>

HOLLAND.

Mr. BRANDON, who has sent very beautiful productions, established his works in 1839; he employs two steam-engines, five hydraulic presses, and about 100 workpeople.

INDIA.

Excellent stearic candles are sent from Cossypore. *Ceylon* has contributed specimens of cocoa-nut stearin and olein.

PRUSSIA.

M. MOTARD was selected as the only Exhibitor to represent Germany, in stearic manufactures; and his articles fully justify the choice of the local authorities. M. Motard exhibits candles made by distillation as well as by lime-saponification.

The wholesale price of stearic candles in Berlin is 1*s.* 0¼*d.* per pound avoirdupois, of stearic acid, 10¼*d.* per lb.; of candles made from the unpressed distilled acids of palm-oil (composite candles), 8*d.* per lb.; and of the unpressed acids, 7*d.* per lb.

In 1846 there were Sixty-nine manufactories of soap, candles, and oils, giving employment to Three hundred and fifty-five artizans; also Five establishments for wax-bleaching and wax-candle making, employing Thirty-two workmen.

RUSSIA.

There are Five Exhibitors of stearic candles in the Russian Department, whose productions are most creditable.

Russia possessed, in 1842, Sixty-two candle-manufactories, which produced annually goods valued at 142,800*l.*; and Two hundred and sixty-six tallow-melting establishments, which yielded tallow valued at 1,578,000*l.*

The price of stearic candles in Russia, varies from 10*d.* to 10½*d.* per English pound.

SARDINIA.

There is One Exhibitor of stearic candles from Sardinia.

SPAIN.

In 1839, while the effects of the civil war which paralysed Spain for some years, were still severely felt, M. JULIAN BERT, aided by M. de Milly, had the courage to establish a manufactory of stearic candles in Spain. The difficulties of inducing capitalists to join in forming a Company being overcome, M. Bert had still to contend with formidable obstacles, from the discontinuance, at that time in Spain, of several collateral branches of industry. He was obliged to erect leaden chambers, and manufacture his sulphuric acid; also, to establish a cooperage, and a boiler-making shop. In spite of these obstacles, his efforts were so successful, that, since that period his Company have established still more extended works at Gijon, where saponification and distillation are both practised, as well as soap-making, on a very large scale. The distillation furnishes 3,500 lbs. of vegetable fatty acids per day. One hundred and fifteen workpeople are employed in the two establishments; they are all Spaniards, and were instructed at the works. There are Two other manufactories of stearic candles, one at Barcelona, the other at Hernani. The wholesale prices of tallow and palm stearic candles are both 1*s.* 3*d.* per pound avoirdupois.

SWEDEN AND NORWAY.

Some of the finest stearic manufactures in the Exhibition are sent by J. JOHANSSON, of Stockholm. The beauty of these productions arises chiefly from the employment of newly-invented machinery, which this Exhibitor obtained from J. and C. G. Bolinder, Engineers in the same town. Several candle-moulds are exhibited which are remarkable for their internal polish. They are made by simply dipping a cold highly-polished steel-rod into a melted alloy, chiefly composed of tin. In this way two workmen can produce from 100 to 110 moulds per hour. M. Johansson employs a steam-engine of twelve-horse power to work the hydraulic presses, slicing and mixing machines, and also a polishing machine, to which the great lustre of his candles is partly due.

TURKEY.

Moldavia contributed some very good specimens of stearic candles from its only manufactory, which possesses a steam-boiler and two hydraulic presses; and produces about Twenty tons of candles per annum.

UNITED KINGDOM.

In 1832 a manufactory of stearic candles was established in London, with the co-operation of M. de Milly; and in 1833, M. Burjot introduced them into the market under the name of moulded wax.

In 1834, W. S. HALE commenced working, and has from this period gradually extended his works, until he has become one of the largest makers of stearic acid and candles in England, by the lime-process. His aim being the manufacture of a commercial article in large quantities, the productions which he contributes have not the whiteness and high degree of finish of those of some other Exhibitors.

It was likewise in 1834 that C. OGLEBY and Co. commenced working. They have since devoted themselves almost exclusively to the highest articles, and their stearic acid and candles are the whitest in the World's Show.

Soon afterwards J. C. and J. FIELD commenced the manufacture, and have likewise directed their attention successfully to the best class productions.

The manufactory of M. Burjot is no longer in existence, but has supplied the foremen employed in the first instance in the works of the three English exhibitors.

The wholesale price of stearic candles in England is 10*d.* per lb.; and that of stearic acid 9*d.* per lb.

Besides those just named, PRICE'S CANDLE COMPANY exhibit interesting products obtained from the distillation of fats; and Mr. Bauwens, the fat acids recovered from waste lyes.

The wholesale price of palm-stearic candles is 9½*d.* per lb., and that of composite candles 5½*d.* per lb.

Imports of palm-oil into the United Kingdom in 1850 :—

				Cwts.
West Coast of Africa	-	-	-	434,179
Other Parts	-	-	-	13,617
Total	-	-	-	<u>447,796</u>

In 1850, 4,672 lbs. of stearic candles were imported into the United Kingdom, and paid 24*l.* duty. This quantity is very insignificant compared with the annual consumption, and arises in a great measure from the cheapness of production in England: another cause, however, is the preference shown by the British public for candles coloured yellow to resemble wax, which description is not manufactured in other countries. It is much to be regretted that this tendency to imitate one material by another should prevail to the extent it does, as it undoubtedly frequently retards the development of each in its own particular sphere. Many instances might be cited in illustration; the imitation of a carpet or marble pavement by oil-cloth, and chintz and silk by paper-hangings immediately occur; to which we may add, as more immediately connected with the subject under discussion, gas-burners made to imitate oil-lamps and candles, as if a tube conveying gas could not be arranged in an ornamental form. But to lower the beautiful white of the pure stearic candle by any contamination appears absurd, after bestowing so much skill upon obtaining it free from colour. Our French neighbours who, in matters of taste, are at least our equals, have long since discarded the

less luminous wax-candle, and invariably use those of pure white stearic acid for their grand fêtes. The Jurors lately witnessed a brilliant illustration of this fact in the gorgeous illumination of the Hotel de Ville at Paris.

WURTEMBERG.

Although the name of one manufacturer is given in the *Illustrated Catalogue*, no stearic candles are exhibited in the Wurtemberg Department.

We now come to the consideration of candles made from wax and spermaceti; these substances, though differing from fats properly so called, present some analogy with them; they are even more closely allied than the fats themselves to the class of bodies called compound-ethers, inasmuch as they are actually combinations of certain fatty acids with the oxides of various alcohol-radicals; for, whilst oxide of glyceryl is common to all the fats and oils before spoken of, the waxes and spermaceti have their own peculiar bases, which, when liberated, are (unlike glycerin) insoluble in water; moreover, waxes are only partially acted upon by weak solutions of alkalies, and spermaceti not at all under ordinary circumstances; and although they may be split up into their proximate components by fusion with the solid hydrated alkalies, or ebullition with their very concentrated solutions, they must be considered as non-saponifiable in the ordinary acceptation of the term. The individual differences of wax and spermaceti will be farther elucidated as we proceed.

(e.)—Wax-Candles.

Under the name of wax are included substances of various origin and of very different composition.* The wax employed in the manufacture of candles is secreted by the honey bee, which has the power of producing this substance from its food (sugar). At one time it was thought that the bee collected the wax ready formed from plants, until Liebig advanced the contrary opinion, which was subsequently corroborated by the experiments of MM. Dumas and Milne Edwards.

A wax known as Chinese wax, and resembling spermaceti in appearance, was formerly supposed to be a vegetable wax; but the researches of Sir George Staunton and M. Stanislaus Julien, have demonstrated that it is the secretion of a male insect, the *Coccus ceriferus*, which deposits it on the trees on which it feeds, particularly the *Rhus succedaneum*.† We owe to Mr. Brodie, a knowledge of the true chemical composition of wax. This chemist, by his recent elaborate researches, has shown that Chinese wax is a compound of a peculiar fatty acid (cerotic), and the oxide of an alcohol-radical (cerotyl), and is consequently cerotate of oxide of creotyl. Ordinary bees'-wax he finds generally to contain 22 per cent.

* The attention of the reader is directed to the following specimens of wax obtained from different sources, and which are but little known. Two examples (273 and 293) of bees'-wax from Tasmania, in the section of *Van Diemen's Land*; berry-wax and bees'-wax from *South Africa*; vegetable wax from *St. Domingo*; and in the *Chinese* section a so-called vegetable wax produced in Szechnen, and also white and yellow bees'-wax.

† For much valuable information respecting the so-called vegetable waxes of China, as well as the other products of that vast empire, the reader is referred to the *Étude Pratique du Commerce d'Exportation de la Chine*, by our colleague, M. Natalis Rondot. Paris, 1849. Guillaumin.

of free cerotic acid, which is soluble in alcohol, and, with potassa, forms readily a soap. The residue, which is nearly insoluble in alcohol, and which has been usually called myricin, he has shown to be a compound of palmitic acid, and the oxide of another alcohol—radical (melissyl), that is, palmitate of oxide of melissyl. He has likewise been able to prepare from wax two new solid hydrocarbons (compounds of carbon and hydrogen), similar to paraffin.

Paraffin would be much too costly to be converted into candles if made from wax, as its preparation entails a considerable loss of material; it is, nevertheless, desirable that it should be obtained cheaply from some source, as it is much better adapted than any other substance for illuminating purposes, from its containing no element besides carbon and hydrogen, which are united in equal equivalents; it is, therefore, exactly of the same composition in a hundred parts as olefiant gas, which gives to ordinary coal- and oil-gases their illuminating power. Examples of paraffin-candles are exhibited by MASSE and TRIBOUILLET in the French Section, which were made from paraffin obtained by distilling bituminous schist; but far more interesting specimens are sent by JAMES YOUNG, Class II., No. 7B, which seem to realize the great problem which the rare sagacity of Liebig* pointed out as far back as ten years ago. "It would certainly be esteemed one of the greatest discoveries of the age," says he, "if any one could succeed in condensing coal-gas into a white, dry, solid, odourless substance, portable, and capable of being placed upon a candlestick or burned in a lamp." Now this very problem Mr. Young appears to have accomplished by distilling coal at a comparatively low temperature, whereby he obtains, instead of gas—the product of intense heat—a mixture of liquid and solid substances, the former capable of being burned in lamps like sperm-oil, or of being used for lubricating machinery, the latter yielding a beautiful mould candle as solid and white as any prepared from paraffin of other sources. The Reporters have not, as yet, been able to obtain a fuller account of the economical bearings of Mr. Young's process,† which will most likely be considered in the Report upon another Class, but they confidently hope that this truly beautiful discovery will not meet with similar difficulties as the plan proposed some years ago for making paraffin-candles out of Irish peat. If coal-paraffin can actually be obtained in sufficient quantity and at moderate cost, we may witness another revolution in the processes of illumination; and the brilliant discoveries of Chevreul, but lately threatened by the splendour of the electric light, may be eclipsed by the general adoption of solidified coal-gas candles.

In most countries, wax intended to be made into candles is previously bleached by a process presently to be described. That this, however, is not always the case, we find by specimens exhibited in the Egyptian and Tunisian Courts. The candles in the latter, which we may infer resemble those of the classical ancients, are true yellow wax "dips," and have a very ungainly appearance. The bees'-wax from which they are made is principally produced in the province of Kirwan; and the primitive method usually adopted for their manufacture consists in merely melting the wax in a copper vessel, and then dipping the wick repeatedly into it.

* *Familiar Letters on Chemistry*, 3rd edition; Letter XII., p. 158.

† According to a statement furnished to the Reporters, 100 parts of cannel-coal, from Bathgate, yielded 40 parts of oil and 10 parts of paraffin.

Although such is the usual mode, the wax is sometimes bleached, and of course finer candles produced, but none such were exhibited. No animal fat is employed in Tunis for the manufacture of candles, although stearic candles of European manufacture are imported, and are in very general use.

Wax is more valuable when bleached, not only on account of the greater beauty, but also from the removal by this operation of impurities which would clog the wick during combustion. It may be bleached by chlorine, but the process is of no value, because its constituents retain a portion in combination, and hence hydrochloric acid is given off in burning.*

The method of bleaching employed is very simple, although tedious: the following, with some trifling variations, is the plan adopted in most countries.

Wax Bleaching.—The wax is cut up into small pieces and placed in a vat, into which steam is made to pass through a perforated coil of pipes: a small quantity of very dilute sulphuric acid being added in the proportion of one pint measure of strong sulphuric acid (oil of vitriol), to one ton of wax, and the whole well agitated for some time. This addition of sulphuric acid facilitates the separation of impurities which subside into the acidulated water.

As soon as, by subsidence, the wax has become bright, it is removed into a trough, with holes in the bottom about the size of an ordinary quill. The melted wax runs through these holes in small streams, on to a wooden cylinder, which is made to revolve, and the lower half of which is immersed in a cistern of cold water. The motion of the cylinder carries up a layer of water, on which the streams of wax fall, and form exceedingly thin ribbons, varying from half to one inch in breadth; these ribbons, by the revolution of the cylinder, dip under water, and as they rise upon the opposite surface, are removed, and spread out thinly and evenly on tables placed in the open air, so as to be exposed to the action of the sun and air for a period varying from five to ten weeks. Once or twice, during that period, the wax is again subjected to the same process of melting; it requires also frequent turning so as to present every portion to the bleaching agency of sunlight.

The fusing-point of wax is raised by bleaching, for yellow wax fuses between 62° and 63° C. (144° and 146° F.), and bleached wax between 64° and 65° C. (147° and 149° F.).

All waxes are not found to bleach with equal facility, according to the statement of Mr. Barclay. For example, English, Hamburgh, Odessa, Portuguese, Mogadore, Zanzibar, East and West Indian, and North American waxes bleach very readily, whilst those from Cuba, Dantzic, Königsberg, Gambia, and Gabon are only bleached with difficulty, and seldom acquire a good colour.

Notwithstanding the difficulty with which Gambia wax is bleached, and its liability to become of a rusty brown, that country furnishes the greater part of the wax which is imported into Great Britain. Large quantities are likewise

* The attempt to bleach wax by means of chlorine, although unsuccessful in a practical point of view, has been very fertile in theoretical results. It is not generally known that one of the leading views in chemistry, the so-called theory of substitution, derived its origin from Gay-Lussac's observation, that wax, when exposed to the action of chlorine, absorbed this element into its composition, releasing an equivalent quantity of hydrogen in the form of hydrochloric acid.

imported from Mogadore, the East Indies, particularly Ceylon and Singapore, and North America; the Mogadore wax is frequently largely adulterated with fat.

From Brazil a curious wax has been imported, the product of a black bee, which hives underground. It is soft, and exceedingly tenacious, and of a dark mahogany colour. It does not appear in the slightest degree bleached after exposure to the sun. A considerable quantity might be imported, but no use has as yet been found for it.

The English wax is the most esteemed of all, but the small quantity produced is absorbed for various purposes without bleaching, on account of its fine quality and its brightness and fragrantcy.

In 1850 the quantity of bees'-wax imported for home consumption in Great Britain was 10,761 cwt., besides a small quantity of vegetable wax amounting to only 5 cwt. There is no duty on wax.

1,067 lbs. of wax candles were also imported and paid 9*l.* duty.

Wax is not well adapted for moulding on account of its tendency to adhere to the mould, and its great contraction in cooling; and though these difficulties may be overcome, yet it is found more advantageous to make wax-candles in the manner about to be described, as they are found to burn much better.

The first process consists in warming the wicks in a stove, and then suspending them to a hoop placed over a vessel of melted wax. The workman pours the melted wax with a ladle on to each wick in succession, and at the same time causes the wick to revolve on its axis by the motion of the fingers; when the candles are about one-third made, they are allowed to cool for a time, and the operation of pouring repeated until the candles are about half made, which is ascertained by the eye or by weighing. Whilst still warm, they are removed from the hooks and subjected to a process of rolling between two marble slabs, so as to render them uniform in thickness. The upper end of each candle is now formed by cutting down the wax to a metal tag which covered one end of the wick. The candles are then again suspended to the hoops, the end which had previously hung downwards being now upwards; and the operations of basting and rolling repeated as often as necessary. Lastly, the lower ends of the candles are cut off to make them of equal length.

The wicks of wax-candles are always made of twisted unbleached Turkey cotton, the fibre of which appears better to resist the temperature of the highly heated wax during combustion. Plaited wicks are not adapted for wax-candles, as the plaiting, by diminishing the capillary action, entails the employment of so large a wick that it obscures the light; beside which, it is apt to curl round and round in the flame, and to collect a quantity of soot.

The large wax-candles, used in churches, are formed by laying the wick on to a slab of wax, which is then folded over on the wick, and the candle finished by rolling.

Long wax-tapers are made by winding the wick on a drum, and then leading it under a guide-roller, placed in a trough of melted wax; from this it passes through a series of holes, progressively smaller, on to a second drum; the operation resembling somewhat that of wire-drawing. A little turpentine is added so as to render the wax pliable enough to wind.

Wax candles are coloured with the following materials:—

<i>Blue</i>	- - -	Artificial ultramarine.
<i>Green</i>	- - -	Mixture of verdigris and emerald green, or verdigris only.
<i>Yellow</i>	- - -	Chrome-yellow.
<i>Red</i>	- - -	Vermilion.
<i>Pink</i>	- - -	Madder-lake.

Wax mortar-lights which are used as night-lights, have wicks of flax, as cotton is not found to be so well adapted to resist the long-continued action of the high temperature, and is not so uniform in its capillary action.

The larger mortar-lights have plaited wicks, and are used principally for warming dishes.

CHINA.

The Chinese employ bees'-wax, the insect-wax before spoken of, and also vegetable tallow (obtained from the *Stillingia sebifera*, a tree of the order *Euphorbiaceæ*), in the manufacture of candles. The insect-wax is purified by filtration through moist rice, and is then, for the purpose of candle-making, mixed with one-hundredth part of oil. Bees'-wax is used either alone, or to form thin shells, into which the vegetable tallow is poured. This plan of encasing a soft with a hard material has been long in use in China, though only of recent introduction in Europe. The only contribution in the Chinese Department is from the Honourable EAST INDIA COMPANY, who exhibit some examples of wax-tapers from Peking.

EGYPT.

From Egypt are contributed a few specimens of wax-candles, some of unbleached and others of bleached wax, which must be characterised as crude manufactures.

INDIA.

The Indian Department contains some well-made short candles of bleached-wax, six and nine inches in length, which are manufactured at Patna. They are designated camphorated wax.

RUSSIA.

The most important contribution of that country is V. SAPELKIN'S (309), which consists chiefly of wax-lights, plain and ornamented, for the use of churches, though there are several for household use. Most of the other collections are small, and consist in some cases only of wax-twisted tapers. Two Exhibitors have sent fancy-baskets made of waxed wicks. In 1842 the wax produced in Russia was valued at 59,200*l*.

TUNIS.

This department contributes the most ungainly candles in the Exhibition.

TURKEY.

The Turkish Department contains specimens of very well made and well-bleached wax-candles, and twisted tapers. The Jury have included these in their

Award to HIS HIGHNESS the SULTAN, as in common with most of the articles exhibited, they were bought in the bazaars, and no individual Exhibitor's name was given.

UNITED KINGDOM.

The most remarkable collection of wax-candles, and specimens to illustrate wax-bleaching, is that of BARCLAY and SON, wax-bleachers, who exhibit in the South-west Gallery. The manufactures are of the highest quality as regards the uniformity of the candle, and especially the very careful attention bestowed on the wick, the value of which was only to be ascertained by burning. The night-lights have the excellent quality of burning the indicated number of hours, which is a point of some importance.

(f.)—*Ornamented Candles.*

The collection of ornamented wax-candles for weddings and fête days is in fair proportion. FRANCE, PORTUGAL,* RUSSIA, and WURTEMBERG furnish specimens. Some decorated wax-candles for Catholic churches are also contributed by TUCKER and CO. to the Mediæval Court, Class XXVI., No. 534.

The only three objects still to be noticed are candles made of two different descriptions of vegetable wax in its natural state. Those from ST. DOMINGO are of a greenish colour, and probably from the wax of the *Myrica cerifera*. The others from NEW BRUNSWICK are dark green. Lastly, there are black candles made from bituminous shale of the Binney Quarry, Scotland, exhibited in the North Gallery, No. 94.

(g.)—*Spermaceti.*

Spermaceti is a white crystalline body, fusing at 49° C. (120° F.). In its chemical relations it is closely allied to wax, and, according to the experiments of Mr. Laurence Smith, appears to be a compound-ether, namely, cetylate of oxide of cetyl; cetylic acid having the same percentage composition as palmitic acid, derived from palm-oil.

Spermaceti is obtained from the oil of the sperm whale, from which it readily crystallizes, especially in cold weather. The purification of sperm oil depends in a great measure on the complete separation of the spermaceti, hence, sperm-oil "bagged" in winter, from yielding a larger quantity of spermaceti, is less liable afterwards to congeal than that bagged in summer.

DESCRIPTION OF THE PROCESS OF SPERMACETI REFINING AT MESSRS. OGLEBY AND CO.'S WORKS, LAMBETH.

Bagging.—To separate the crystallized spermaceti, the sperm-oil is filtered through long cylinders of bagging, lined with linen, these are at one end tied on to the nozzles of a feed-pipe communicating with a tank elevated about 6 feet, whilst the other end of the cylinder is tied up with a string. The oil being pressed upon

* There is a manufactory of stearic candles in Lisbon, but it has not contributed any of its productions.

by its own column, readily passes through the bags, which retain the spermaceti. This operation is called bagging, and is performed on a very large scale in the autumn and winter.

The spermaceti is of a dingy-brownish colour, and is readily removed from the bags, which are open at both ends; in this state it is called "bagged sperm."

Pressing.—The bagged sperm is then placed in hempen sacks, and subjected to a pressure of about 80 tons in an hydraulic press, which removes the greater portion of the adhering oil.

Second Pressing.—The pressed sperm is now melted, and crystallized by slow cooling, and after being ground to powder, is folded up in square pieces of bagging, and then subjected to the action of a much larger hydraulic press, capable of exerting a force of six hundred tons. The oil which runs from this press contains a small quantity of spermaceti, and is, therefore, returned to the bags to be filtered.

Refining.—The spermaceti is next melted in a large iron vessel, and boiled for some time with a solution of caustic soda, which readily saponifies the sperm-oil still adhering to the spermaceti, whilst it has scarcely any action on the spermaceti itself. By this means the sperm-oil is removed in the form of soap.

Hot-pressing.—The purified spermaceti is removed from the boiler, and run into flat tin-moulds to crystallize. It is then ground again to powder, and placed in linen bags, interleaved with horse-hair mats, and previously heated iron-plates, and pressed in a horizontal hydraulic hot-press, heated by steam.

Second Refining.—The hot-pressed spermaceti is then removed and boiled with a strong alkaline lye, the temperature reaching 113° C. (235° F.) By this final operation it becomes as colourless as water, and has only to be cast into blocks for the convenience of storing.

The wholesale price of spermaceti at present is 1s. 10d. per pound in England.

Spermaceti-candles are moulded in the usual manner, about 3 per cent. of wax being added to prevent crystallization. Spermaceti-candles are often coloured yellow with gamboge, and are then known by the name of transparent wax.

The wick of the spermaceti-candle is of plaited bleached cotton, and requires no previous preparation.

UNITED KINGDOM.

There are remarkably fine specimens of spermaceti and spermaceti-candles in the English Department, contributed by four Exhibitors.

There are also specimens from the UNITED STATES, and NEW SOUTH WALES, of a less important character.

It will be seen, from the subjoined account of Imports into the United Kingdom, that very little spermaceti is brought in as such, and that the major part is obtained by refining sperm-oil.

Imports during the Year 1850.

				Duty.
Sperm-oil	-	Tuns	5,792	Free.
Spermaceti	-	lbs.	1,120	"
Spermaceti-candles	-	"	728	20l.

There are Sixty-four Exhibitors of candles of all nations, of these there are :—

1	Holder of a Council Medal.
20	Holders of a Prize Medal.
10	Who obtained Honourable Mention.
33	Unrewarded.
—	
64	
—	

The number of Exhibitors from the various countries is as follows :—

America - - - - -	1	Brought forward - - -	45
Austria - - - - -	6	Prussia - - - - -	2
Belgium - - - - -	3	Russia - - - - -	8
British Colonies - - - - -	8	Sardinia - - - - -	2
China - - - - -	1	Spain - - - - -	1
Denmark - - - - -	1	Sweden and Norway - - -	1
Egypt - - - - -	1	St. Domingo - - - - -	1
France - - - - -	8	Tunis - - - - -	1
Great Britain and Ireland - - -	14	Turkey - - - - -	2
Holland - - - - -	1	Wurtemberg - - - - -	1
Portugal - - - - -	1		
	—		—
Carried forward - - - - -	45		64
			—

The Sixty-four Exhibitors of candles admit of classification according to the description of candles they chiefly exhibit, for only two have contributed in more than one of the classes into which they may be subdivided. Thus, there are Seven tallow-candle makers, Twenty-one wax-candle-makers and wax-bleachers ; Four spermaceti-refiners or spermaceti-candle-makers, and Thirty-two stearic acid and stearic-candle manufacturers. Nine of the latter exhibit soap, but only as a secondary product of their stearic manufacture ; it has not, therefore, been taken into consideration under the head of soap and perfumery.

Before specifying the contributions of each Exhibitor who has received the award either of a Council Medal, Prize Medal, or Honourable Mention, a few words may be said to illustrate the point of view from which their merits have been judged. From our introductory remarks respecting the different varieties of candles, it is evident that tallow, stearic acid, composite, wax, and spermaceti candles cannot be judged by the same standard, as the various products serve different purposes, and on account of the difference in their cost can scarcely be said to compete one with the other. The physicist may determine their relative illuminating power by experiment, and can, by comparing the price of similar quantities of different materials, ascertain the relative illuminating value of each variety. If carefully executed, such experiments may yield very positive results as to the purely economic question of the money-cost of a given quantity of light, but are of no avail in estimating the advantages offered by the different articles in point of cleanliness, purity, or presentability ; how, for example, can the relative purity of stearic acid, wax, or spermaceti be estimated ? how can the blue white of stearic acid, the brightness of wax, the transparency of spermaceti be measured by such means ; and how the convenience of the self-snuffing candle ?

If photometric experiments on the different illuminating powers of flames are to be of any value, they must be instituted with extreme care and accuracy.

Hitherto the results obtained by different physicists have been marked by great discrepancies ; this is to be explained by the difficulties which present themselves in the method of determination at present pursued. We need scarcely remark that we have not instituted experiments of this kind for the purpose of comparing the different varieties of candles exhibited. The amount of material submitted to the Jurors was so extensive, as to compel them to confine themselves to judging of the quality of the productions by their external appearance, and the manner in which they burned. On account of the great difference in the fiscal relations of the countries contributing, and the great variation in the price of the raw material, it was not even possible to take into consideration the question of price which was given in some instances.

A little practice, however, soon enabled the Jurors to separate the different articles into the three classes of Excellent, Good, and Mediocre. The characters by which these were fixed were—colour, density, and fusing-point of the candles, brilliancy, and steadiness of the flame, continuous consumption of the wick, and less or greater tendency to gutter in a current of air.

LIST OF AWARDS.

APOLLO STEARIN COMPANY, Vienna (Austria, No. 39). Prize Medal, for an interesting display of stearic acid in blocks, and stearic candles ; this is one of the largest, while at the same time, it is one of the best in the Exhibition. The great excellence of these candles manufactured by the process of lime-saponification, their hardness and whiteness are evidences of a thorough knowledge of this chemico-mechanical art, and of a minute attention to all the details of the various processes, without which no such articles could be produced.

BARCLAY and SON, Regent Street, London (Class IV. No. 24). Prize Medal. A very large collection, illustrative of the processes of wax-bleaching and wax-candle making. Also wax night-lights, and wax mortar-lights for warming dishes on the dinner-table. The Medal is awarded to these Exhibitors, chiefly on account of the excellence of the above-named products ; but as they exhibit likewise, remarkably good Stearic and Spermaceti candles, these latter are included in the Award.

BAUWENS, L. F., Grease-Works, Wakefield (Class IV., No. 26). Prize Medal. The Award to this Exhibitor is for the recovery of fatty acids, applicable to soap-making and to the manufacture of candles, from the waste lyes and suds of the woollen, silk, and cotton manufactories. The quantity of soap used by the various branches of manufactures in favour of which the soap-duty is remitted, amounted in the year 1850 to 22,858,382 lbs., which may be estimated as containing, on the average, about 50 per cent. of fats, or 11,429,191 lbs., or in round numbers 5,000 tons. The importance, therefore, of economising this otherwise waste product, will be fully appreciated if it be taken into consideration, that the manufacture of wool entails moreover the employment of a large quantity of oil, which is afterwards removed by washing. The quantity of oil employed for this purpose in Great Britain, may be estimated at about 6,000 tons,* contained in the suds in

* In the year 1850, 278,022 bales of foreign wool, each containing, on the average, 250 lbs., were imported into London, Liverpool, Hull, and Leith ; so that about 31,000 tons were im-

addition to the fat contained in the soap, making together about 11,000 tons. But supposing that from unavoidable sources of waste only 5,000 tons were annually recoverable, and estimating it to produce 15*l.* per ton, the value would still amount to 75,000*l.*

BERT, J. J. and Co., Madrid and Gijon (Spain, Nos. 245 and 246). Prize Medal. The Jury award to M. Bert a Prize Medal for products of the highest class from the two manufactories he has established in Spain. From that of Madrid, in which saponification by lime only is practised, he sends beautiful Stearic acid and Stearic candles; from that of Gijon, in which he has lately erected a distilling apparatus to include the most recent improvements of England and France, he sends Palmitic acid equal to any in the Exhibition, together with candles made of it. These latter candles are allowed by the Catholic clergy of Spain to be used in the churches.

BRANDON, N. D., Amsterdam (Holland, No. 70). Prize Medal. The Candles exhibited by Mr. Brandon are a proof that, in Holland, the stearic manufacture has reached its highest state of perfection; his candles are all that can be desired in hardness and careful moulding. The long Stearic candles, which in Holland are allowed by the clergy to be used in churches, are very beautiful specimens of manufacture. The interest in the collection of this Exhibitor is enhanced by the intermediate products which he has sent to illustrate the various stages of the process.

BRIEN, C., Dublin (Class XXIX., No. 90). Honourable Mention. Mr. Brien exhibits very well manufactured tallow Mould-candles, which are white and hard.

CAMPENHOUDT, CHARLES VAN, and Co., Heusden, Flanders (Belgium, No. 436). Prize Medal. The productions of these makers, whilst they are the finest in the Belgian Division, may vie with most in the Exhibition for whiteness and hardness. Their candles named "*Bougies de l'Étoile*," are beautifully moulded, and have a high degree of polish.

DELACRETAZ and FOURCADE, Vaugirard, near Paris (France, No. 158). Honourable Mention. Messrs. Delacretaz and Co. are extensive contributors to the Exhibition, having sent some very large blocks of Stearic acid, which is hard, but not of the highest degree of whiteness; the Jury, therefore, though they cannot award a Prize Medal to them, accord an Honourable Mention for their productions, which are very good, and which it appears they manufacture on a very extensive scale.

DIXON, GEORGE, Dublin (Class XXIX., No. 91). Honourable Mention. The Jury make Honourable Mention of the clarified tallow Mould-candles of great whiteness, hardness, and exterior polish, made of a mixture of purified tallow and stearic acid; also of the composite candles, and the Yellow-soap exhibited by Mr. Dixon, which is likewise well manufactured.

DONNEAUD and Co., Paris (France, No. 478). Honourable Mention. The Jury accord an Honourable Mention to Messrs. Donneaud and Company, for their Stearic acid, and Stearic candles, called "*Bougies du Phare*;" though not possess-

ported in that year; and as about 20 lbs. of oil are consumed in "working" or scrubbing every 112 lbs. of wool, there must have been upwards of 5,500 tons used for the *foreign* wool only.

ing that whiteness for which the Stearic acid of many Exhibitors is remarkable, still their products are very creditable, the candles being well moulded.

DUMORTIER and Co., Lyons (France, No. 1593). Prize Medal, for most excellent white and hard Stearic candles, well polished, and carefully moulded.

FIELD, J. C. and J., Wigmore Street (Class IV., No. 130). Prize Medal, for the very fine blocks of white and hard Stearic acid, which they exhibit, and which evince a thorough knowledge of the stearic manufacture.

FREEMAN, E., Wigmore Street (Class IV., No. 25). Prize Medal, for very excellent spermaceti candles, called "transparent wax." The spermaceti candle (containing a small quantity of wax, to prevent crystallization), is in many cases preferred to wax, on account of its greater transparency, and brilliancy of flame. The peculiar tint of the wax is imitated in these candles by the addition of gamboge.

HALE, W. S., Queen Street (Class XXIX., No. 99.) Honourable Mention. The productions which Mr. Hale exhibits, though very creditable, are not of the highest class, and seem more especially confined to the cheaper description of Stearic candle, and those very economical, though not so presentable, sources of light, the so-called "Composite candles," which possess the property of being self-snuffing, and are much cheaper than the cheapest stearic candle, though from their low fusing-point they are not so well adapted for use in hot climates.

HOLMBLAD, L. P., Copenhagen (Denmark, No. 27). Honourable Mention, for a small collection of Stearic candles, exhibited in connection with other articles by M. Holmblad. They are white and hard, but extremely high in price.

JAILLON, MOINIER, and Co., La Villette, near Paris (France, No. 273). Prize Medal. The stearic acid manufactured by these Exhibitors is made according to a recently-patented plan, which consists in passing a rapid current of sulphurous acid into the lime-vat, during the process of saponification, by which they state that they are able to produce a much greater quantity of solid fats than if they operated without the introduction of sulphurous acid*; besides which, that they are enabled to use the commonest tallow, and produce white inodorous candles. The Jury could not enter into an experimental investigation of the merits of this new plan, and, therefore, wish it to be understood that the novelty, or the supposed or real advantage of the process did not in the least influence the award of the Prize Medal, which is given solely on the merits of the products exhibited. The Stearic acid and candles are, without doubt, amongst the best in the Exhibition, whilst they are the whitest in the French Department made by the process of lime-saponification.

JOHANSSON, J., Stockholm (Sweden and Norway, No. 17). Prize Medal. The stearic acid contributed by this Exhibitor is eminently pure, white, and hard, and is, with one single exception, the whitest in the Exhibition. It is most creditable to M. Johansson to have stood the test of comparison with so many veterans in the art, and to have come off with such high honours. The candles exhibited are most beautifully polished, more highly so than any others, and in other respects well moulded; the polish is due to a peculiar mould, which is exhibited, and which is produced by a peculiar method already described in the introductory notice (p. 1383).

* The chemist cannot help thinking of the conversion of the liquid oleic acid into the solid elaidic acid.

MASSE, TRIBOUILLET and Co., Neuilly (France, 1346). Prize Medal. Messrs. Masse, Tribouillet, and Co., are amongst the largest Exhibitors in this Department, having contributed no less than thirty-five samples, illustrative of several very important branches of art connected with the manufacture of candles. Seven samples relate to that important industry in an economical point of view, the recovery of fats from waste suds and other refuse matter; as, for example, the parings of skin, and animal intestines. The candles manufactured from the distilled and pressed fats are very beautiful, hard, and white. There are seven also which show the progress of the manufacture of Palmitic candles by the process of distillation, and include candles made with the unpressed fat acids, likewise very hard and white pressed Palmitic acid candles, also candles made with a thin shell of hard Palmitic acid, the centre being filled with the unpressed fatty acids.* Three are the products of the recovery of fats from the waste suds of the wool-washers, and are similar to the first named. Four relate to the manufacture of candles from vegetable wax. There are also three specimens of the products of distillation from bituminous schist, including Paraffin-candles; and candles covered with lithographic transfers, which it appears are used in France, but they have a very common appearance. Besides these, there are specimens of oleic acid, olein, from pressed tallow, and oleic acid-soda soap. The Jury award the Prize Medal to Messrs. Masse and Tribouillet for their very beautiful candles, manufactured from various fatty acids produced by the process of distillation, and their extensive and interesting collection of products relating thereto.

MATISEN, A., and Co., St. Petersburg (Russia, No. 305). Prize Medal, for very beautiful Stearic acid, of which MM. Matisen have sent seven blocks, and Stearic candles, of excellent manufacture. These productions have a great degree of hardness, and are very carefully moulded.

MILLER, T. J., Dorset Wharf, Westminster (Class IV., No. 29). Prize Medal. An interesting collection in the South-West Gallery, showing the progress of Spermaceti-refining, also an enormous and beautifully crystallized hollow block, or grotto of Spermaceti, in the Western Nave. The Jury award the Prize Medal to this manufacturer on account of the very high degree of excellence to which he has brought the process of spermaceti-refining, as evinced by the absence of colour and impurity in the large mass he has exhibited, to produce which, no less a quantity than 3 tons, or 6,720 lbs. were fused at one time. After being allowed to remain at rest for a week, the spermaceti had cooled sufficiently round the circumference of the cask to be tapped, when about one-half was run out; so that the shell which is exhibited, at 1s. 10d. per lb., is worth 308l.

MILLY, LOUIS ADOLPHE DE, Paris (France, No. 644). Council Medal. M. de Milly exhibits stearic candles, called by him "*Bougies de l'Etoile*," a name which, with that of Milly (stearin), is applied all over Europe to similar products. He has sent, likewise, Lime-soap, the mixture of fat acids resulting from the decomposition of this soap, pressed Stearic acid, and Oleic acid, so as to illustrate the various steps in the process; and besides these, oleic acid, potash or soft, and soda or hard-soaps, made with the oleic acid. In consideration of M. de Milly being the first to solve the manufacturing problem of applying M. Chevreul's beautiful

* See page 1389 — China.

theoretical discoveries to the production of candles, the application of boracic acid for the preparation of candle-wicks, and the aid he has always rendered in establishing this chemical art in other countries, the Jury recommended M. de Milly to the Council of Chairmen as worthy of the Medal in their gift.

MILLY STEARIN-CANDLE COMPANY, Vienna (Austria, No. 40). Prize Medal. For a very splendid display of the stearic acid manufacture, both by the process of distillation and the older one of lime-saponification. This Society have, in compliment to the Exhibition, sent three large and well-executed stearic acid Medallions; one of the Emperor of Austria, one of Her Majesty Queen Victoria, and one of Prince Albert. Their candles made by the process of lime-saponification are very hard, white and well moulded, and their night-lights or *veillieuses*, carefully manufactured. They have also exhibited the so-called "Composite" candles made with the unpressed products of the distillation of palm-oil.

MOTARD, A., Berlin (Prussia, No. 262). Prize Medal. Very excellent Stearic candles manufactured by the process of lime-saponification, exhibited in connection with the Stearo-margaric acid of which they are made; also, Stearic candles made of the unpressed and pressed fatty acids derived from Palm-oil, by the process of distillation. The stearic candles from the hot-pressed fatty acids of palm-oil are very beautiful; those made with the acids as they run from the still are an excellent and cheap substitute for the tallow-candle. The collection is well arranged, and illustrates both processes very satisfactorily.

OGLEBY, CHARLES, and Co., Lambeth (Class XXIX., No. 139). Prize Medal. The Stearic candles contributed by this Firm are the whitest in the Exhibition, and were used by the Jury as a standard of excellence, with which the productions of other Exhibitors were compared. The so-called "Transparent wax" candles made with a mixture of stearic acid and wax are very beautiful, and burn with a remarkably dry cup. The Spermaceti in block, also exhibited, is of the greatest whiteness, and most beautifully crystallized. The Spermaceti candles, and those made of a mixture of spermaceti and wax, are exceedingly well manufactured. The Prize Medal is awarded by the Jury for the Spermaceti and Stearic manufactures, either of which would have entitled these Exhibitors to the Award.

PITANSIER, Odessa (Russia, No. 307). Prize Medal. The piece of hot-pressed Stearic acid exhibited by M. Pitansier, is prepared from mutton-tallow; it is extremely hard and sonorous, and beautifully white; the Stearic candles are the whitest and best in the Russian Section, and occupy a first rank in the Exhibition.

POISAT (Uncle) and Co. (France, No. 1399). Honourable Mention. The Jury make Honourable Mention of a few small pieces of Stearic acid, exhibited with other articles, by MM. Poisat and Co.; and which, from their diminutive size, had almost escaped observation. The Stearic acid was very white and hard.

PRICE'S PATENT CANDLE COMPANY, Belmont Works, Vauxhall (Class IV., No. 83). Prize Medal, for the invention of improved methods of distilling fatty bodies, illustrated by the following articles: very beautiful white and hard Candles manufactured from the distilled and pressed stearic acid of Palm-oil; candles equally hard and white, made from distilled animal fatty acids recovered from the Refuse of the Glue-maker, and which possess an additional interest in being

obtained from a waste product ; and candles made from the distilled Vegetable tallow obtained from the *Stillingia sebifera*. Besides these, they exhibit the unpressed distilled fatty acids of Palm-oil, in the state in which they are largely employed for the manufacture of the so-called composite candles, which appear to be destined to supersede the ordinary tallow-candle. See the Prefatory Notice respecting the recommendation for the award of the *Council Medal* (p. 1335).

QUANONNE, C. and J., Cureghem, Brabant (Belgium, No. 431). Prize Medal. The manufactory of these Exhibitors, which was the first established in Belgium, is one of the offshoots of that of De Milly, in Paris ; hence, they adopt the name for their candles which was given to stearic candles by their instructor, namely "*Bougies de l'Étoile*." As regards colour and hardness, their stearic acid leaves nothing to desire ; but their candles are not quite so carefully moulded as they might be ; and have not that high degree of polish which is expected in candles of first class manufacture in other respects.

ROSSI and SCHIAPPARELLI, Turin (Sardinia, No. 6). Honourable Mention. Though the Jury did not find the stearic manufactures of these Exhibitors quite equal to the best examples, they consider the stearic acid and candles to be carefully made, and therefore accord them an Honourable Mention.

SAINTE and Co., Cossypore (India, Class XXIX.). Honourable Mention. The Jury have much satisfaction in making an Honourable Mention of the very good stearic candles manufactured in India by Messrs. Sainte and Co. The local manufacture of Stearic candles deserves every encouragement, as they are peculiarly suitable to hot climates, on account of their high fusing-point, and as there must be a large quantity of fats of little value, which would answer well for their production.

SAPELKIN, V., Moscow (Russia, No. 309). Honourable Mention. The Jury accord to Mr. Sapelkin an Honourable Mention in consideration of the great care bestowed on the manufacture of Wax-candles for church-service ; many of these are tastefully ornamented with a simple spiral of gold, and have a very elegant appearance. The equality in size of the candles, as compared with one another, and likewise of their diameter throughout their whole length, are points deserving commendation. It appears that in the Greek Catholic Churches only wax or vegetable oil is allowed to be burned.

III.—PROTEAN STONE, OR ARTIFICIAL IVORY.

Under this title there are exhibited, in Class XXIX., a number of articles, such as door-handles, finger-plates, inkstands, and letter-weights. These very beautiful objects are composed of a new material, derived from gypsum (native bi-hydrated sulphate of lime), which, by numerous variations in the method of treating it, is made to resemble ivory, granite, and various kinds of marble. From the specimens exhibited it appears to be very hard, and capable of taking the highest polish, which, it is said, is perpetuated by use. It is translucent and brilliant in colour, and, being tinted throughout the mass, the marbling and mottling are not liable to be rubbed off. It appears to be applicable to many purposes for which ivory and marble are at present used ; but it is not fitted to be made into knife-handles on account of its brittleness.

In order to illustrate this very ingenious manufacture, we must recal to the recollection of the reader the very familiar phenomenon of the solidification of a mixture of plaster-of-Paris (de-hydrated sulphate of lime) and water, which arises from the circumstance that the *anhydrous* sulphate of lime re-combines with water equivalent in quantity to that of which gypsum is deprived by heat in the formation of plaster. But, as under the conditions of this solidification the plaster is diluted with far more water than it can re-combine with, it results that a portion must be left in a free state in the interstices of the mass, which is consequently opaque, and, on drying, becomes porous; and although it is the same in chemical composition, it differs greatly in its physical aspect and properties from the native compound gypsum or alabaster, which is crystalline and translucent.

In reflecting on the cause of this difference, it occurred to Mr. Cheverton that if the combination of water and anhydrous sulphate of lime could be slowly effected, whilst the latter was in a state of compression, an artificial stone might be produced, compact and crystalline in texture, and translucent in appearance. This view was fully confirmed by a series of experiments.

The process by which these results are obtained is described in the specification of Mr. Cheverton's patent, obtained in June 1850, as consisting in the de-hydration and subsequent re-hydration of native bi-hydrated sulphate of lime, either in a compact form, as alabaster, or in the state of a fine powder. In the first instance the alabaster is wrought into the required form; and in the second the material, in the state of a very fine powder, is compressed into a mould of the proper shape.

In either case, after the object has been fashioned, it is exposed for 48 hours to a temperature of from 121° to 177° C. (250° to 350° F.), by which means the water originally combined with the sulphate of lime is driven off. The substance thus becomes very friable, but still retains the form into which it has been wrought. Sometimes plaster-of-Paris itself is compressed into moulds, but the article so formed is still subjected to the operation just described, notwithstanding the previous baking of the gypsum.

If a translucent appearance is required to be given to the surface of the figure, it is, before re-hydration, immersed into "white hard varnish," olive-oil, or other "oleaginous matter," until the surface is saturated; but if an opaque surface is desired, then this operation is omitted.

To effect the hardening, the object is plunged for an *instant only* into water heated to a temperature of from 38° to $65\frac{1}{2}^{\circ}$ C. (100° to 150° F.). This operation is repeated at intervals of from 10 to 15 minutes, until the sulphate of lime is completely saturated. The mass then becomes crystalline and much harder than alabaster; a circumstance which induces a belief that the new substance contains a quantity of water in combination different from that in the native body: or, in other words, that it is a new hydrate of sulphate of lime. The success of this part of the process depends in a great measure on the very gradual manner in which the combination with water is managed; for without due care the material decrepitates, and the article is then destroyed.

The colouring is effected by dissolving the requisite colours in water, and either sprinkling the object here and there with the coloured solution so as to produce a mottled appearance, or else by immersing it altogether in the dye, which produces

an uniform stain. This operation is performed previous to that of dipping in oil or varnish.

To the only Exhibitors of this branch of manufacture,

D. STAIGHT and SONS (Class XXIX., No. 252), a Prize Medal is awarded.

IV.—BLACKING.

Although the compound which we now call Blacking (French, *Cirage*) is in all probability of very recent invention, nevertheless it appears to have been customary to imbue shoes with an oily mixture before the time of Pliny, since it is stated by him, that Cato recommended the dregs of the olive (after the expression of the oil), to be used for anointing bridle-reins, leather-thongs, and shoes, in order to render them supple.* It must, however, be remarked that a mixture somewhat similar to modern blacking is also described by the same author,† and it appears quite natural to infer the occasional use of it for renovating the black colour which we are also informed was given by shoemakers to leather, by means of vitriol:‡ two kinds of substances of this name being known, namely, blue-vitriol (sulphate of copper) and green-vitriol (copperas, or sulphate of iron).

The mixture alluded to was chiefly used for ink, whence it was commonly called *atramentum*. It was composed of lamp-black, gum, and vinegar, and would, therefore, only have required the addition of oil and honey to make it into a tolerable blacking. This inference is rendered the more probable from the discovery of the remains of leather found in the Roman gravel-pit, discovered in digging the foundation for the New Royal Exchange, which appears to have been covered with a sort of blacking. They are thus described by Mr. Tite, the Architect.§ “The fragments, in general, are of black leather, similar to that of the other articles; but there are some pieces which may possibly have been once of another colour. It is most probable that the upper surface was almost always shining, and several instances may be noticed where it still retains a dull gloss, which appears usually to have protected that particular side.”

The French word “*Cirage*,” however, renders it extremely probable that modern blacking was originally composed chiefly of wax and tallow, and probably lamp-black; and somewhat similar, therefore, to harness-blackening. That ordinary liquid-blackening was first imported into France from England, is probable, from the circumstance that blacking was termed *Cirage Anglais*, at all events to the year 1830, and it may still be known by that name.

When or how the English mixture now employed was first discovered, the Reporters cannot pretend to decide; but, according to the statement of Mr. William C. Day (nephew of Mr. Charles Day), the recipe for its preparation was communicated to Mr. Richard Martin whilst he was travelling on the Continent. Mr. Martin afterwards became associated with the late Mr. Charles Day; and in 1801 they commenced the manufacture of blacking. Mr. Martin having retired in 1808, the business was still carried on under the names of Day and Martin, by Mr. Day, until his death, in 1836, by which period he had acquired a colossal fortune.

* *Nat. Hist.*, Book xv., chap. viii.

† *Ibid.*, Book xxxiv., chap. xii.

‡ *Nat. Hist.*, Book xxxv., chap. i.

§ *Antiquities of the Royal Exchange*, 1848, p. 56.

To give some idea of the extent of the operations still carried on at "Day and Martin's," it may be stated, that on the average 150 casks, containing a quantity of blacking equal to 900 dozen pint bottles, are sent out per day. The price of the stone-ware bottles, for containing the blacking, varies with their size, the usual sizes costing 6s., 9s., and 12s. per gross; and the corks (bungs) costing 1s. 4d. per gross. There is also a large outlay required for labels and sealing-wax.

Besides the establishment of Messrs. Day and Martin, there are, in London, two other very important blacking-manufactories. One of these was founded by Mr. Robert Warren, who commenced about the same time as the firm already noticed, and retired some years back; but the business is still carried on by his successors; and the other was founded, at a subsequent period, by Mr. Everett, who commenced business in King's Head Court, Holborn, and afterwards transferred his manufactory to Fetter-lane, where it still exists; Mr. Everett died in 1840, not, however, before he had realised a considerable fortune. Only the last-named of these large blacking-works contributes to the Exhibition, and unfortunately its manufactures were not brought under the notice of the Jury.

Blacking, it may be remarked, consists essentially of two principal components, namely, a black colouring-matter and certain substances which will acquire a gloss by friction. Each maker has, of course, proportions and methods of mixing peculiar to himself, but the chief materials used are the same in most cases. In England* they generally consist of:—Bone-black, sugar or molasses, sperm-oil, sulphuric acid (oil of vitriol), and strong vinegar. These, according to Mr. W. C. Day, are mixed in the following order:—The bone-black, in the state of a very fine powder, and the sperm-oil are first thoroughly incorporated; the sugar or molasses, mixed with a small proportion of vinegar, is now added and well-stirred with the mass; strong sulphuric acid (oil of vitriol) is then gradually poured into the vessel. Much heat is generated at this stage of the process, and an effervescence ensues, owing to the action of the acid on the carbonate of lime contained in the bone-black. The object of the sulphuric acid (which should not be in excess), is to cause the decomposition of the tri-basic phosphate (and the carbonate) of lime, contained in the bone-black, so as to produce on the one hand sulphate of lime, and on the other a soluble acid phosphate. Sulphate of lime, when produced under such circumstances, gives rise to a very tenacious paste, by mixing with the finely divided carbonaceous matter of bone-black disintegrated by the same reaction; which paste (or lake) is capable, when spread out, assuming a very smooth surface. To this the sugar and the oil impart the property, not only of adhering to the leather, but also of taking a high degree of lustre under the frictional (or burnishing) action of the brush; the oil is moreover very useful in rendering the leather pliable.

The mixture, after the action of the acid has ceased, is diluted with an additional quantity of vinegar, and is bottled whilst it is still warm. By bottling the liquid in this state, and corking and sealing it immediately, a rarefied space is formed; and

* According to the information which Baron Liebig has kindly furnished to the Reporters, it appears that, in Germany, blacking is made in the following manner: powdered bone-black is mixed with half its weight of molasses, and one-eighth of its weight of olive-oil; to which are afterwards added one-eighth of its weight of hydrochloric acid (muriatic acid), and one-fourth of its weight of strong sulphuric acid. The whole is then mixed up with water to a sort of unctuous paste.

there is no liability afterwards that the blacking (if it wet the cork) will exude by the expansion of the air contained in the bottle, as it is not likely to become again heated to the same temperature under the influence of any climate to which it may be subjected. The vinegar employed should not be too weak, otherwise the blacking will not keep.

Paste-blackening is now made in precisely the same way as Liquid-blackening, excepting that the last portion of vinegar is not added. The employment of such blackening appears to have preceded that of liquid-blackening. It was usually stuck on to a small shovel-shaped board, having a very short handle; and it was wetted with water (or saliva) as required. The old Cake-blackening differed in composition from that of the present day, and appears to have contained lamp-black, treacle, and oil.

AMERICA.

Two Exhibitors send both Liquid and Paste-blackening, the former being contained in glass bottles, and not stone-ware as in England. The blackening was found to be nearly of the same quality from both; but not so good as that commonly used in England. The contributors are E. STEERE, No. 290, W. R. BAKER, No. 401. T. TURNER, No. 425, sends Edge-blackening for shoemakers.

BRITISH COLONIES.

C. WARD contributes a specimen of blackening, but it calls for no especial notice.

FRANCE.

In 1847 there were, in Paris, One hundred and thirty-seven manufacturers of blackening and varnish for shoes, who employed 140 workpeople, and produced goods to the value of 38,800*l.*; France is, however, represented by only One Exhibitor in this trade, M. HÉBERT, who sends a specimen of varnish for boots and shoes, which was not submitted to the Jury of Class XXIX.

PRUSSIA.

The only contribution is from C. TEICHMANN; it consists of Paste-blackening, which, though of fair quality, is not equal to the English blackening.

SARDINIA.

B. BOURGOIN exhibits specimens of Paste-blackening for shoes, and paste Harness-blackening, which call for no particular comment.

UNITED KINGDOM.

The contributions of two Exhibitors only were brought under the notice of the Jury of Class XXIX., namely, Nos. 272 and 281: of these, the best is that of S. B. ALCOCK and Co., of Dublin (No. 272), whose productions are here favourably noticed, although no Award was made. The wholesale prices of their usual size bottles of liquid-blackening are 3*s.*, 6*s.*, and 9*s.* per dozen.

The manufactures of the other Exhibitors who contribute to Classes II., No. 22; IV., No. 70; XVI., Nos. 39 and 322—were not observed by the Reporters until the duties of the Jury were completed.

The number of Exhibitors from all parts is Thirteen. There were no Awards.

The classification according to the various countries is as follows:—

America, United States of	-	-	-	3
British Colonies:—Van Diemen's Land	-	-	-	1
France	-	-	-	1
Prussia	-	-	-	1
Sardinia	-	-	-	1
United Kingdom	-	-	-	6
Total	-	-	-	13

V.—CHEMICAL MATCHES.

The manufacturers of chemical matches are placed in an anomalous position with regard to the other contributors in the Great Exhibition, inasmuch as that they were not permitted to send their *actual produce*, on account of the precautions deemed advisable to be taken for the security of the Exhibition Building against fire. Hence they were compelled to rest satisfied with contributing unflammable imitations of their articles; and under such circumstances it is evident that it was quite impossible for the Jury to make any equitable Awards in this branch of industry. This result is the more to be regretted as the manufacture of chemical matches, although comparatively a very recent art, has been of late years developed in a most remarkable manner; and notwithstanding the high degree of perfection to which it has already attained, it is still undergoing further improvements consequent on the rapid progress of chemical science. Had it been possible to have foreseen and provided against all contingencies, an out-building might have been constructed for the reception of these goods, which would have afforded a secure as well as a most valuable opportunity of comparing the relative merits of the matches prepared in various countries.

In another part of this Report will be found some descriptive notices of several conveniences for travellers and others contained in the hollow heads of walking-sticks. One of these consisted of an apparatus for procuring instantaneous light, and the contrivance appears almost to realize the fable of Prometheus, who concealed the fire which he stole from Jupiter in his *narthex*, ferula, or stem of fennel, on which he leaned in travelling.

“I am he who sought the source of Fire,
Enclosing it hid in my narthex-staff;
And it hath shown itself a friend to man,
And Teacher of all Arts.”*

This invention, however, was in reality only the means of preserving fire unextinguished, somewhat like the German tinder of the present time, and not of causing

* Æsch., *Prometh. Vinc.*, 110.

instantaneous ignition. The giant-fennel, of which the ordinary ancient walking-sticks were made, sheds its seeds about September, when the stem decays, and becomes a substance so easily ignited as to be employed in Sicily for tinder. The pith of the plant also is stated by Proclus to be an excellent preserver of flame; to which Pliny adds his testimony, that it makes excellent matches, the Egyptian sort being the best.*

There is, however, another form in which a staff may be metaphorically said to conceal fire, since one of the most primitive means of producing it was by the friction of two pieces of wood against each other until sparks were emitted, and flame was then easily communicated to dry leaves or decayed vegetable matter. This method of procuring fire has been found generally in use in several savage nations, though with some difference in the process; and St. Pierre describes one of the most common, as practised by the West Indian negroes:—"With the sharp edge of a stone," says his narrative, "Paul made a small hole in the branch of a tree that was sufficiently dry, which he fixed firmly between his feet, and he then employed the stone to shape into a point another piece of wood, equally dry, but of a kind different from the former. He next placed the pointed wood in the hole which he had provided, and made it to turn rapidly between his hands like a chocolate-mill, and in a few moments he saw smoke and sparks issuing from the place of contact, and then collecting dry plants and sticks, he lighted a fire at the foot of the palm-tree."†

It appears that the same process was in ordinary use with the Romans down to even a late period, even when the flint and steel were well known. "This experience," says Pliny, "was first discovered in camps and by shepherds, when a fire was wanted and a fitting stone was not at hand; for they rubbed together wood upon wood, by which attrition sparks were engendered, and then collecting any dry matter of leaves or fungi, they easily took fire. For this purpose nothing is better than to rub the wood of the ivy with that of the laurel, and a wild vine, different from the *labrusca*, which grows upon trees in the manner of ivy, has been also proved to be good."‡ The same authority, in enumerating the different kinds of wood fit for kindling a light, denominates them *igniaria*, or those trees out of which fire may be produced. *Pyxidicula igniaria* appears to have been the usual name of a Roman tinder-box, but Solinus calls the fire-box *Ignitabulum*, and assigns its invention to Pyropolis, in the island of Delos.§ In those receptacles the apparatus probably consisted as well of a small iron bar and a fragment of flint or pyrites, as of pieces of those woods which were the most readily ignited. Virgil notices "the hidden fire in the veins of flints,"|| as being one of the benefits anciently bestowed on man at the commencement of the reign of Jupiter; and pyrites are described by Pliny as being well known and esteemed for producing sparks. Certain of them, he says, "have much fire in them, whence we call them *living*, and they are very heavy. They are sought for because they are most valuable in camps; for when they are struck hard with an iron spike (*clavus*), or another

* Proclus, *Comment. in Hesiod, Opera et Dies*, i. 52. Pliny, *Hist. Nat.*, xiii. 22.

† *Suite des Études de la Nature: Paul et Virginie*.

‡ *Hist. Nat.*, xvi. 40.

§ *Polyhistor*, c. xi.

|| *Georg.*, i. 135.

stone, they will emit sparks, which being taken by sulphur or dry fungus or leaves, will cause them to catch fire even with the rapidity of speech."*

There does not appear to be any information extant relating to the material anciently employed for tinder, unless it may be presumed to be indicated in that passage of the Prophet Isaiah (chap. i, v. 31) which declares that "the strong shall be as tow and the maker of it a spark, and they shall both burn together, and none shall quench them." It is probable that a very small degree of experience would suggest the thought that flax or the linen wicks used for lamps would easily receive sparks and become ignited, but of this there has not been any certain information preserved.

For many centuries the apparatus of a stone struck against a piece of iron continued, with but little improvement, to be the only means of procuring light. By the Saxons the flint or the pyrites was used under the general name of *fyr-stan*; and any piece of iron that was sufficiently substantial was the substitute for the modern steel. A writing-stylus is known to have been used for the purpose by the Abbot Bertin in Burgundy early in the seventh century; an instrument, however, which should be at once more substantial and more convenient for striking, must have been soon required, and was probably as speedily invented in the form of the *fusil*, a thick rhomboidal piece of steel, having the faces cut into many angles. This was in use at a very early period of the Middle Ages, when it is frequently to be found mentioned under a variety of names, all of them being derived from the same original. In 1429 Philip the Good, Duke of Burgundy, established the Order of the Golden Fleece, in the collar of which the flint and steel of the time formed the principal device.† The latter was therein represented as a short and stout fusil, sharpened to a pointed edge on one side, and on the other having two small curved handles, with a vacant space between them for the hand; and a modification of this shape for the steel continued to exist to the close of the history of the old-fashioned tinder-box.

It was not until after the middle of the eighteenth century that the discovery of phosphorus indicated a quicker or more certain means of procuring light or fire. In 1677 Dr. Hook, in one of his Cutler Lectures, described the effects of phosphorus, as they had been recently exhibited in England to the Hon. Robert Boyle and several other Fellows of the Royal Society, by Daniel Krafft, "a famous German chemist." Even after all the earliest experiments, however, the new matter appeared to be regarded only as a curiosity, which Boyle entitled the "*Noctiluca*," and "a factitious self-shining substance," procured but in very small quantities, and with great labour and time; the principal value of which was to supply a light in the night or in dark places, when exhibited in glass vessels. It can scarcely be doubted but that some trial was made as to whether an ordinary match could be inflamed by the substance, but Boyle's recorded experiments refer only to the strength, the diffusion, and the continuance of the light.

After these notices of the older apparatus devised for procuring light, it will be an interesting inquiry briefly to glance at the history of chemical matches. And here it may be first remarked that the transition from the tinder-box, with its

* *Hist. Nat.*, xxxvi. 19.

† Du Fresne, *Glossarium*, 1736, vi. col. 562, voce Sol, 3.

flint and steel, to the elegant friction-match, was not so simple as a superficial consideration of the subject might lead one to infer. In the daily enjoyment of a luxury, we but too often forget the persevering efforts which are always necessary to render available the discoveries of the experimental philosopher, and take but little heed of him whose disinterested labours are constantly bringing to light new truths from the hidden but inexhaustible stores of nature.

The perfecting of chemical matches has been accomplished chiefly during the last thirty years, for before 1820 scarcely any other method of producing fire was employed than that of the well-known trio before alluded to, with which the ordinary sulphur match was inseparably associated.

Soon after this period, Doebereiner made the remarkable discovery that finely-divided platinum (*spongy platinum*) is capable of inflaming a mixture of hydrogen gas and atmospheric air, and he founded on this property of platinum the invention of the Instantaneous Light Apparatus, first known by the name of Doebereiner's Hydrogen-Lamp. This was greatly admired at that time, and is even now frequently employed, it having been again recently applied to light an ordinary gas burner, required to be ignited at intervals during the day-time for the purpose of sealing parcels and other similar objects. Although it was without any immediate influence on the development of the manufacture of chemical matches, which had before this time been repeatedly attempted, Doebereiner's discovery appears, nevertheless, to have attracted attention more generally to the subject, and thus, at least, to have contributed indirectly to their perfection.

A method of producing ignition, proposed about the same period, has never been generally adopted. It depends upon the property which certain compounds of phosphorus and sulphur possess of inflaming when slightly rubbed, in contact with the atmosphere. For this purpose about equal quantities of phosphorus and sulphur are fused together in a glass tube, which is to be subsequently closed with a cork.* Upon opening the tube, if a splinter of wood be dipped into the mass, so that a small quantity of the composition may adhere to the wood, it will become ignited when slightly rubbed on the cork used to close the phial. This apparatus, however, has become almost entirely obsolete.

The first important and permanent improvement in the means of obtaining light consisted in covering the sulphurized end of a match with a mixture of sugar and chlorate of potash; which being deflagrated by immersion into concentrated sulphuric acid, communicated the inflammation to the underlying coating of sulphur. Many persons will call to mind the small glass phial containing asbestos moistened with concentrated sulphuric acid, which is usually fixed in a paper or tin box having two compartments, one of which held the prepared matches. These matches were in all probability invented in France, whence at least they were certainly first introduced into England; but prior to their introduction Captain Manby had been accustomed to employ a similar mixture for firing a small piece of ordnance for the purpose of conveying a rope to a stranded vessel; and indeed the composition was also described by Parkes in his *Chemical*

* To those who would repeat this experiment, we would remark, that the fusion should be performed with great caution, inasmuch as the mixture frequently detonates at the moment when the components enter into chemical combination.

Catechism,* amongst the experiments illustrative of combustion and detonation at the close of the volume.

Exactly the same principle was involved in the preparation of the matches invented by Mr. Jones of the Strand, and used for some time in England under the name of "Prometheans," but which do not appear to have found their way to the Continent. These were made of a roll of paper, into one end of which was placed a small quantity of a mixture of sugar and chlorate of potash, with a small tube (hermetically sealed), similar to those in which the leads of ever-pointed pencils are preserved, containing a minute quantity of strong sulphuric acid. By compressing the match with a pair of pliers, sold for the purpose, or between two hard substances (between the teeth, for example), the tube was crushed, and the sulphuric acid came into contact with the mixture, and ignited it. These matches, though very convenient, were so expensive that they were not very generally employed; but they certainly formed, as it were, the stepping-stone to the production of the friction-match.

The first true friction-matches, or congraves, made their appearance about the year 1832. They had a coating of a mixture of two parts of sulphide of antimony and one part of chlorate of potash, made into a paste with gum-water, over their sulphurized ends, and were ignited by drawing them rapidly *between* the two surfaces of a piece of folded sand-paper, which was compressed by the finger and thumb.

The Reporters have not succeeded in learning with certainty by whom the substitution of phosphorus for the sulphide of antimony was first suggested; the mixture of the sulphide with chlorate of potash required so much pressure to produce the ignition that it was frequently pulled off from the match, and this substitution was therefore an important improvement.† The phosphorus-matches or lucifers appear indeed to have been introduced contemporaneously in different countries about the year 1834. In Germany they were first manufactured on a large scale in the Grand Duchy of Hesse, and especially in Darmstadt, where Dr. Moldenhauer, in particular, contributed much to the improvement of this branch of industry.

From Darmstadt the manufacture was gradually extended throughout Germany; but its progress was at first very slow, on account of the lucifer-match being prohibited, until the year 1840, in Bavaria, Brunswick, Hanover, and various other states, on account of the alleged increased risk of fire consequent upon its employment. At present, however, there are manufactories established in Vienna, Prague, Triesch, Schüttenhofen, and Goldenkrön, Berlin, Nuremberg, Ludwigsburg, Ulm, Gmünd, Warnemünde, and numerous other places.

According to Dr. Moldenhauer and Professor Schrötter (to whom the Reporters take this opportunity of expressing their thanks for most of the statistical and other information respecting the progress of the art in Germany), there are in the province of Starkenburg, Grand Duchy of Hesse Darmstadt, no less than Eight

* Third Edition, 1808, p. 563.

† Detonating mixtures of chlorate of potash with either sulphide of antimony or phosphorus, are described in Parkes' *Chemical Catechism*, 10th Edit., published in 1822; and the latter in the 3rd Edition (1808).

manufactories, producing weekly about 500,000 boxes of matches, which are valued at 3,000 florins (257*l.*); yet the Grand Duchy is unrepresented in the Great Exhibition as to the production of (artificial) chemical matches.

In Austria, the manufacture of chemical matches has been of late developed to so great an extent, that it supplies not only what is required for home consumption, but also enough to form an important article of exportation; indeed it appears that the most important item of Austrian commerce with Chili consists of matches.

The matches manufactured in Austria amounted in 1849 to 50,000 cwt., of which four-fifths were consumed in the country, and one-fifth was exported. From Trieste 3,787 cwt. were shipped, viz., to

	Cwts.
Turkey - - - - -	1,226
Greece - - - - -	596
Malta - - - - -	492
Egypt - - - - -	382
Ionian Islands - - - - -	336
Naples - - - - -	225
Other Countries - - - - -	530
Total - - - - -	<u>3,787</u>

That the export trade of Austria in matches is rapidly increasing, appears from the following statement of the quantities shipped on the Elbe during the last three years:—

Quantities shipped on the Elbe in	Cwts.
1848 - - - - -	286
1849 - - - - -	790
1850 - - - - -	1,860

As matches are not always specified in the Official Report on Commerce, it is not possible to give a detailed statement of all the quantities exported.

It is estimated that of the total production of matches in Austria, one-third is manufactured in Bohemia and two-thirds in the factories of Vienna and its vicinity. The number of factories in Bohemia is ten; of these there are Two in Prague, One of which exhibits; One at Schüttenhofen, which also exhibits; One at Budweis, One at Toplitz, One at Taus, One at Tschernoschin, One at Schönthal, One at Nahoschitz, and One at Hohenelbe. These establishments give employment to about 1,000 workpeople.

In Austria Proper there are Twenty-two factories, namely, Sixteen at Vienna, two of which exhibit, Three at Fünfhaus, One at Schärding, One at Tulle, and One at Pottenstein; there is also one in Moravia, which likewise exhibits. The number of workpeople employed is about 2,000.

In illustration of the quantities of the different materials employed, it may be stated that a Bohemian manufactory employing 100 workpeople produces annually about 200,000 boxes, each containing 5,000 matches. It consumes annually 25 cwt. of nitre, $6\frac{1}{2}$ cwt. of phosphorus, and 300 cwt. of sulphur. Calculating on this data, the total amount of materials consumed in all Austria, the following numbers are obtained:—

	Cwts.
Nitre - - - - -	1,250
Phosphorus - - - - -	325
Sulphur - - - - -	15,000

The quantity of soft wood consumed annually amounts to 5,000 *klafters* or fathoms; and it is worthy of notice that a large portion of it is manufactured into splints in Budweis, and thence sent to Vienna. About 50,000 millions of single matches are produced annually in Austria. These are made with astonishing rapidity, in consequence of the employment of a simple plane of peculiar construction; with this instrument a single workman cuts off 1,814,000 splints in a day of 12 hours.

From other parts of Germany there are Four Exhibitors: namely, one from Prussia, Two from Wurtemberg, and One from Mecklenburg-Schwerin; the Reporters, however, have not been able to ascertain how far they represent the manufacture in all those places; but they are enabled to state that there were Twenty-one manufactories, employing Five Hundred and Sixty-one workpeople, in Prussia in 1846.

According to a statement of M. Payen, the quantity of phosphorus consumed in France for lucifer-matches amounts to 30,000 kilogs. (590 cwt.), whilst 100 kilogs. (2 cwt.) suffice for all the other purposes for which it is used. In 1850*, 220 kilogs. ($4\frac{3}{10}$ cwt.) were exported to England. From these numbers it would appear that the quantity of lucifers manufactured in France must exceed that of Austria in the ratio of 590 to 325, or as 18 to 10. Yet France is unrepresented in this art, the only contributor exhibiting sliding-boxes to contain the matches.

The Reporters have not been able to collect any information respecting the extent of this manufacture in the United Kingdom. In 1850 there were 50,000 gross of matches imported into the port of Hull: but the Reporters are unable to state the total number imported into the United Kingdom, as chemical matches are entered in the Customs' returns under the general head of "Goods non-enumerated."

Formerly large quantities of phosphorus were imported into the United Kingdom for the purpose of chemical match-making; but it will be seen by the following table, that this substance must now be made within the British dominions in sufficient quantity to supply the entire demand.

VALUE of the IMPORTS of PHOSPHORUS into the United Kingdom.

	From 9th July.	From Denmark.	From the Hanseatic Towns.	From Holland.	From France.	From all Parts.
	£.	£.	£.	£.	£.	£.
1842†	1	45	14	1,102	1,162	
1843	-	1	20	2,349	2,370	
1844	-	-	83	2,484	2,567	
1845	-	-	25	1,474	1,499	
1846	-	12	-	619	631	
1847	-	22	52	498	572	
1848	-	16	15	149	180	
1849	-	29	60	33	122	
1850	-	2	-	1	3	

Although lucifer-matches are made to some extent in the United States, there is no exhibitor of them in the American section.

* Previous to 1850, phosphorus was comprised among the "*Produits Chimiques*."

† Previous to the 9th of July 1842, the imports of phosphorus were entered under the general head of "Goods non-enumerated."

In continuing the narrative of the progress of this manufacture, we may next observe that, as it extended, all the processes were much simplified, and as a consequence, the prices of the articles produced were lowered. Nor was this the only improvement, for a whole series of inflammable compounds was successively tried; and at last, by substituting, entirely or partially, saltpetre for chlorate of potash, the detonation attendant on the earlier matches was avoided. It was also found that the sulphur-coating of the match could be to a great extent, or even entirely, dispensed with, and the cause of the unpleasant odour previously accompanying ignition in a great measure removed. Beside the ordinary match of wood, numerous other materials were devised, which could not have been made with the original composition of sulphide of antimony and chlorate of potash; as, for instance, wax-taper matches, fusees of Amadou (German tinder), and brown paper, Vesuvians for insertion into a segar, &c. The roughly-formed wood-matches, also, which had been previously cut by hand, were superseded by others carefully rounded by machinery.

The match having reached this point of perfection, some attention was given to the embellishment of the boxes by the various manufacturers, who tried to excel each other in the elegance, convenience, and security of the case, for which various materials were employed—for instance, cardboard, wood, and metal—the latter being usually ornamented with coloured lacquers and engine-turning.

With regard to the composition for the matches now in use, Dr. Ure, in the *Supplement* to his *Dictionary of Arts and Manufactures*, p. 153, gives the following recipe of Dr. R. Boettger:—

	Parts.					
Phosphorus	-	-	-	-	-	4
Nitre	-	-	-	-	-	10
Fine glue	-	-	-	-	-	6
Red ochre, or red lead	-	-	-	-	-	5
Smalt	-	-	-	-	-	2

The glue is to be converted into a smooth jelly with a little water, and put into a warm mortar to liquefy; the phosphorus is then to be rubbed down with the gelatine, at a temperature of from 60° to 65½° C. (140° to 150° F.), after which the nitre is to be added, then the red powder, and, lastly, the smalt, the whole being carefully mixed until it becomes an uniform paste.

Lucifer wood-matches that inflame without sulphur are prepared, according to Dr. Ure, by the ends being rubbed against a red-hot iron plate, and then dipped for a moment into melted white wax, contained in a shallow flat-bottomed pan.

In March 1842 Mr. Reuben Partridge obtained a patent for forming wooden splints, by pressing, with suitable machinery, a block of wood against a steel plate perforated with holes, placed together as closely as possible. The wood is thus forced through the perforations, being first split, as it advances, by their cutting edges, and comes out on the opposite side of the plate in the form of a multitude of distinct splints. Much attention has also been paid to the improvement of the apparatus for dipping the matches.

Before closing this short sketch of the manufacture of chemical matches, the Reporters wish to draw scientific and public notice to the terrible disease to which it sometimes gives rise. Dr. Lorinser, of Vienna, in 1845, first called the attention

of men of science and the public to the fact, that individuals working in lucifer-match manufactories were subject to pain and swelling of the jaws, followed in many instances by exfoliation of the bone. This was repeatedly confirmed by other observers, and induced several Governments to institute inquiries into the matter. The results of all the investigations made into this interesting question have been collected by Doctors Von Bibra and Geist, in a publication entitled *Die Krankheiten der Arbeiter in Phosphor-Zündholzfabriken*, Erlangen, 1847.

The disease has been observed principally in Germany, but it is also met with elsewhere, and especially in England.* The Reporters had the opportunity of obtaining some information on the subject from Dr. Sieveking, who has examined the disease with much care as it occurs in the London manufactories. According to his observations, the affection assumes the same character as it has done in Germany, and attacks those only who are engaged in dipping the matches into the inflammable compound, and who are therefore more immediately exposed to the phosphorous vapour. Dr. Sieveking saw several of these workmen (dippers) who had lost almost the entire lower jaw. After these painful statements, it is important and consolatory to know that the same physician has not found the disease to be equally prevalent in all manufactories; and that if cleanliness be enforced, and the dietary of the workpeople well attended to, and especially if a complete and continuous ventilation of the workshop be kept up, no evil consequences ensue. Dr. Sieveking met with parties who had been engaged in dipping matches for more than ten years, without exhibiting the slightest tendency to the complaint.

The importance of attending to the precautions indicated by these investigations can scarcely be sufficiently impressed upon the manufacturer. Much has been already done by several firms, especially in regard to ventilation, but much remains to be accomplished if this frightful scourge is to be entirely removed. For this reason manufacturers should direct their attention to an important discovery made by science, in the shape of the so-called red or amorphous-phosphorus. Some few years ago Professor Schrötter, of Vienna, observed the curious fact, that if ordinary phosphorus be exposed during a certain period to a temperature of from 250° to 260° C (482° to 500° F.), it is converted into a red modification, which no longer possesses the main characteristics of phosphorus, viz.,—volatility, fusibility, and inflammability at comparatively low temperatures. The poisonous qualities have also entirely disappeared in this modified condition of the substance. The amorphous modification of phosphorus, which but a few years ago was a mere curiosity in chemical laboratories, can now, however, be manufactured according to a method proposed by Schrötter, in large quantities, and is likely to become an important article of commerce. The Chemical Section of the Exhibition (Class II., No. 119) contained a fine specimen of this substance, sent in by J. E. STURGE, of Birmingham. The red phosphorus being perfectly innocuous when handled, and not giving off fumes in the atmosphere, whilst it is as well adapted to the manufacture of matches as the ordinary phosphorus, it is fair to assume that its general adoption by lucifer-match makers will prove a farther guarantee against the disease of the workpeople. It is right also to mention that DIXON, SON, and Co., have exhibited matches made with Schrötter's phosphorus (Class II., 126). These

* *British and Foreign Medico-Chirurgical Review*, vol. i., p. 446, et seq.

manufacturers state that they are as cheaply and as easily made as the common matches, and are not so liable to fire in the making.

The number of Exhibitors of imitation matches and other means of obtaining light is Fourteen. The classification according to the several countries is as follows:—

Austria	-	-	-	-	-	5
France	-	-	-	-	-	1
India	-	-	-	-	-	1
Mecklenburg-Schwerin	-	-	-	-	-	1
Prussia	-	-	-	-	-	1
United Kingdom	-	-	-	-	-	3
Wurtemberg	-	-	-	-	-	2
Total	-	-	-	-	-	<u>14</u>

LIST OF EXHIBITORS.

BELL and BLACK, Bow Lane (Class XXIX., No. 243). Imitation Vestas, Congreves, and Wax-Matches; Camphorated round wood Congreves.

DE MAJO, S., Triesch (Austria, No. 50). Imitation Lucifer-matches in great variety.

DIXON, SON, and Co., Manchester (Class II., No. 126). Matches made with Professor A. Schrötter's Phosphorus.

FURTH, B., Schüttenhofen and Goldenkron (Austria, No. 46). A large display of Imitation Lucifer-matches, in a variety of boxes.

HARRASS, P., Suhl (Prussia, No. 798). Imitation Lucifer-matches.

HOFFMANN, C. and G., Wisoczan, near Prague (Austria, No. 49). Imitation Lucifer-matches.

KUHN, J., Ulm (Wurtemberg, No. 102). A variety of Imitation Lucifer-matches.

LEFRANCOIS, —, Paris (France, No. 301). Sliding-boxes for lucifer-matches, and Taper-stands for lucifer-matches, and amadou, in great variety.

MEYER, W., Warnemünde (Mecklenburg-Schwerin, No. 6). Splints for Lucifer-matches.

POLLAK, A. M., Vienna (Austria, No. 47). Imitation Lucifers of several kinds.

PRESCHER, F., and Co., Vienna (Austria, No. 48). Various descriptions of Imitation Lucifers.

RAJAH OF JESSELMERE (India, Class XXII.). Several Steels for striking light, which are interesting as connecting the present with the past in the art of obtaining fire.

SANDELL, E., Putney (Class XXIX., No. 97). Odoriferous Lighters, made of embossed card.

SUTORIUS, C. F., Gmünd (Wurtemberg, No. 100). Lucifer-matches without the combustible material.

VI.—CONFECTIONARY.

The articles belonging to this species of preparations submitted to the Jury of Class XXIX. consisted, firstly, of fruits preserved with sugar; and secondly, of

confections, comprising sweetmeats made both from sugar and from chocolate. Of preserved fruits, the Exhibition contained many examples; including some which had been prepared with sugar and subsequently dried, and others preserved and kept in syrup.

In the most ancient times, honey constituted the principal and nearly the only sweet substance used for those purposes for which sugar is now almost universally employed; and the Egyptian department in the Exhibition furnishes evidence that its use for the preservation of fruit is still continued in the valley of the Nile. Many interesting specimens of the most simple forms of conserves are also contained in the Turkish and Tunisian collections, consisting of the desiccated pulp of prunes or juice of the grape. It is possible that the former preparation may somewhat resemble the "cakes of figs" of the ancient Hebrews, which, from the two passages of Scripture wherein they are mentioned (1 *Samuel*, xxv. 18, xxx. 12), were evidently regarded as agreeable and nutritious food. That the Jews had some kind of artificial sweet preparation at a very early period of their history, is indicated by the statement, that the taste of the manna "was like wafers made with honey" (*Exodus*, xvi. 31), though the parallel passage in *Numbers*, xi. 8, expresses it to have been like "fresh oil." The word Confection, and the term Confectionaries, as they occur in the Scriptures, have two distinct significations in connection with this particular subject. In the first instance, the strict original sense of the expression as derived from *con* and *facere*, to make up together, is intended; as in the words "thou shalt make it a perfume, a *confection* after the art of the apothecary, tempered together pure and holy," *Exodus*, xxx. 35. When, however, Samuel says to the elders of Israel concerning their king, that he would take their "daughters to be *confectionaries*, and to be cooks and to be bakers" (1 *Samuel*, viii. 13), there is a special and a distinct employment of the makers of some kind of conserves or sweet-preparations referred to, of which no decided information is extant. From two well-known remarkable passages in the Prophets, there can be little doubt that the Hebrews were acquainted with the existence of the sugar-cane, probably as it was found in China.* They both prove, however, that it was a very costly rarity; and the three words which in the Scriptures denote sweet substances, are all rendered honey in the Authorized Translation, though possibly they indicated several kinds of it. The passages which are supposed to refer to sugar are very different from these. "Thou hast bought me no *sweet-cane* with money," says the remonstrance in *Isaiah*, xliii. 24; and "To what purpose cometh there to me incense from Sheba, and the *sweet-cane* from a far country?" is the complaint in *Jeremiah*, vi. 20. In both these places the allusion is to an offering to the Almighty, which, presented in a right spirit, would not have been rejected. This, therefore, could not have been honey, because in *Leviticus*, ii. 11, the positive command is given, "Ye shall burn no leaven, nor any honey, in any offering of the Lord made by fire." The substance referred to must therefore have been either the sugar-cane, or the aromatic sweet-rush. The word rendered Calamus in *Exodus*, xxx. 23, in the direction for making the

* The earliest records of China make mention of the culture of the sugar-cane and the extraction of the sugar; the application of which as food appears to have been known in the most remote ages of Chinese history.

anointing-oil for the furniture of the tabernacle is also *Kenah Bosen*, or sweet-cane, in the original; but this is generally supposed to mean the Indian *Calamus Aromaticus*.

Although the cane-sugar of Asia must have been well known to the classical ancients, yet they seem to have regarded it as a kind of factitious honey. In this form Herodotus* appears to refer to it, when he says that the Gyzantes have bees "which make a great quantity of honey, and it is said that *confectioners make much more*." The original words of the historian in this place have the general signification of compounders, or workers, for the people.† From the context, however, it is evident that the terms are to be understood as implying preparers of confections, as they are also in another passage of the same author, wherein it is stated that the confectioners of the city of Calletabus "make honey with tamarisk and wheat." It may be observed farther that the same word is likewise used in the title of the fragment of an epigram, attributed to Menander, relating to the making of a bride-cake. It consists of a short conversation, in which the operator represents that he has watched the preparation all night, but that there is yet much to be done. Such a person as this, who understood the art of confectionary, as retained by the wealthy Romans, was called *Pistor Dulciarius*, or a baker of sweet things; and several of the bronze moulds which the pastry-cooks of the time employed for the making of their sweetmeats, representing hearts, striated-shells, animals, and a variety of elegant devices, have been discovered at Herculaneum. About the same period, also, Apicius, Columella, and Pliny prove that some fruits at least were preserved in syrup. The last author recommends that quinces should be boiled in honey; and directs that other sorts should be enclosed in wax. The latter process Beckmann states to have been likewise employed for preserving the apples carried every year from the southern districts of Russia into the northern parts of Siberia.

But though the value of sugar as a luxury was not unknown to the ancients, it was, from its first introduction to a comparatively late period, more commonly employed by physicians for the disguising of disagreeable medicines, and in the pharmaceutical preparation of syrups, electuaries, and confections. This practice appears to have led to the intimate connection which so long existed between the preparation of conserves and the compounding of drugs. Actuarius, who is considered to have flourished between the twelfth and fourteenth centuries, is said to have been the first physician who substituted sugar for honey in medicinal compositions; about which time also it was frequently used in cooking in England.‡ Dioscorides, in the first century, is the earliest author by whom it is mentioned by name, and he also notices its medicinal properties.

The art of making sweet compositions being thus early associated with the occupation of the apothecary, and his productions being known under the general title of confections, the same name appears, for a time at least, to have been used for the preparers both of sweetmeats and of medicine. In the thirteenth and

* Melpomene, exciv., cited in Pereira's *Elements of the Materia-Medica*, 2nd Edit., ii. p. 895. *Herodotus, a New Translation*, by the Rev. H. Cary, 1848.

† Δημιουργοὺς ἄνδρας. Ἄνδρες δημιουργοὶ, *Polymnia*, xxxi.

‡ The *Forme of Cury*: edited by the Rev. S. Pegge, p. xxvi.

fourteenth centuries, there were certain officers called apothecaries retained by princes and great personages, who prepared various preserves for the table, especially fruit incrusted with sugar; but it is quite possible that these individuals were sometimes ecclesiastics, who also possessed the knowledge of medicine and pharmacy. Beckmann has recorded many curious notices illustrative of the connection existing between the professions of the apothecary and the confectioner, as they were publicly established in Germany from the middle of the fifteenth century. From these statements it is evident, that the term *apothecarius* was then understood to signify the keeper of a storehouse or magazine for articles belonging to the *Materia-medica*, where also medicines might be properly compounded, and confections and cooling liquors prepared for the sick. These establishments were licensed by authority, and the persons who kept them endued with exclusive rights and municipal privileges; in return for which they were sometimes required to supply the court or the town-council with confectionary or sugar, as well as to vend their medicines at appointed rates.

It is probable that in such a stipulation of furnishing confections and sugar to public authorities, originated the practice which became common in England in the sixteenth century, of presenting rich boxes of sweetmeats or lozenges to great personages on their journeys, or at certain seasons; or pastry of elaborate ornament as royal new year's gifts.* Many curious instances of the latter custom will be found in the lists of new year's gifts made to Queen Elizabeth, of which the two following may here be adduced in illustration, as they include sweetmeats, preserved-fruits, and pastry:—"1562. By Revell, surveiour of the works; a marchpane, with the modell of Powle's church and steeple in paste. By John Hemingway, *poticary*; a pott of oringe-condytt, a box of pyne-comfytt, musked, a box of manus-christi, and lozenges."

Before this period, the practice of the confectionary art had ceased to be confined solely to the compounders of medicine, and its productions had long since been regarded as belonging rather to festivals and banquets than to the dietaries of the sick. The delicacy and rarity of the articles used in confections, and the neat dexterity required in preparing them, probably suggested it as a most graceful female employment; hence we find that, in the seventeenth century, the art of making sweetmeats became established as a fashionable feminine accomplishment, and was publicly taught both in France and England.

Manufacture of Comfits and other Bonbons.

The following is a description of the processes employed at the manufactory of Mr. SCHOOLING, one of the Exhibitors, of Bethnal Green, the workmen being chiefly French.

Smooth-Comfits.—The preparation of comfits is very simple. If seeds, such as almonds, or carraway-seeds, are to be made into comfits, they are placed together with a cream made of sugar-syrup and starch, into a flat ellipsoidal copper pan, suspended by chains over a charcoal-fire. By tilting the pan up and down, and at

* This custom is still kept up in France, as regards the presentation of boxes of sweetmeats on the first day of the new year; and will be noticed in speaking of the contributions from that country.

the same time giving it a circular swinging motion, the seeds are made to roll one over the other, and thus gather the pasty mixture as it dries. This operation is repeated as often as may be required for the seeds to accumulate a sufficient thickness. The form of the seed governs that of the comfit.

Pearled-Comfits.—Cinnamon, coriander-seed, and celery-seed, are usually "pearled" by placing the mixture of syrup and starch into a copper funnel, suspended over the pan containing the comfits or seeds. This funnel is, in shape, like the small half of an egg, and has a round hole in the bottom, which is more or less closed by a long conical stick, suspended to the handle of the funnel, and passing through a guide to keep it central. By allowing the plug to descend sufficiently, it may be made to close the hole. The aperture is regulated in such a manner as to allow the mixture merely to fall in drops; at the same time, a short jerking motion is given to the pan. The paste, as it dries, gathers on the comfits in little knobs, called pearls.

Machinery for making Comfits.—Mr. Schooling employs the following simple contrivance. An endless-band, formed of strips of iron hoop riveted on two leather straps, traverses over four rollers, so placed that their axes, when seen on end, form an irregular square, the top roller at that end towards which the band travels being much higher than the top roller at the opposite end. The metallic band is not drawn tight, but left loose in order that it may form a sort of bag to contain the materials, by drooping between the top rollers; the frame of the machine forming the ends of the bag. A coil of steam-pipes, following the curve of the band, serves to dry the comfits, which are gathered with a rolling motion up towards the highest side, and then rolled over in a contrary direction.

Another Exhibitor, Mr. WOTHERSPOON, of Edinburgh, employs an apparatus consisting of a steam-pan, open at one end, and revolving in a vertical direction on a hollow axis, through which the steam passes in and the condensed water passes out. This pan is in shape like an orange, supposing a horizontal axis to be placed in the eye, and a disc of about a third part of the diameter of the orange to be cut out of the rind at the side opposite to the axis; and in order to complete the simile, supposing that the rind to be hollow so as to contain steam. The seeds and syrup are placed at the open end, and by the slow revolution of the copper-pan, are gathered up and rolled over in the same manner as on the endless band.

Messrs. OUDARD, SON, and BOUCHEROT, of Paris, also manufacture comfits by steam-machinery, and have done so since 1844: before this period a skilful workman could make from 45 lbs. to 55 lbs. per day, but at present he superintends six pans, each of which produces 112 lbs., so that in a day he manufactures 6 cwt., or twelve times as much as he could produce by hand. This machinery, having been adopted by other Parisian confectioners, has caused a reduction of 30 per cent. in the price of comfits in France.

Sugar-Pastilles are made of a paste of powdered sugar and syrup, combined with such flavouring and colouring matter as may be required. A small quantity of this paste is heated over a charcoal-fire, and then placed in a spouted-ladle. By inclining the ladle, a small quantity oozes out at the spout, and is cut off with a wire; the drop, as it falls on a tin-plate, forms a flattened semi-ellipsoid; as soon as

the tin plate is covered, it is removed to the drying-stove. A single workman, in this way, can make three or four hundred-weight of pastilles in a day.

Jujubes are composed of a mixture of gum-mucilage and syrup, which is run into flat tin-trays, and consolidated by evaporation in a chamber heated by steam. As soon as the cake has been sufficiently dried, it is allowed to cool, and is then cut into long strips by passing it through a pair of rollers, the bottom one being a plain cylinder, and the top one composed of a number of discs placed on an axis and kept apart at the required distance by collars; the strips are afterwards cut transversely with scissors.

Motto or *Surprise-nuts* are made by drilling out the thick end of the nut with a rose-cutter running in a lathe; the kernel is then removed, and the shell filled with mottos and comfits, and lastly stopped up with chocolate. Many tons are made annually by Mr. Schooling.

Liqueur-Bonbons.—The manner of making liqueur-bonbons is nearly the same, whatever may be their shape. A syrup is made with water and sugar, and is then taken a little at a time by the workman, who evaporates it to the proper consistence, and adds alcohol or some alcoholic liquor. In the mean time his assistants have prepared several moulds, by filling shallow trays with powdered starch, and impressing plaster-of-Paris models of the required form into it, so as to produce corresponding depressions. Several models are fastened on a rod, and thus a number of matrices are made at one operation. The workman then takes a portion of syrup, and runs it into the moulds either from the egg-shaped funnel, before spoken of, or from ladles having several spouts, according to the nature of his work; the latter being used for small drops, the former for large bonbons. The cohesion of the syrup being greater than its attraction for the starch, it runs away from the latter as water does from an oily surface; and the upper surface thus takes a spheroidal form. A little starch is now sifted over the surface of the mould, and it is then set aside in a warm closet. Crystallization commences on the outside of the bonbon, and forms a crust which encloses the syrup; this gradually yields more and more of its sugar, and becomes itself more dilute. In this way a man and two boys will run off about 3 cwt. of bonbons per day.

Liqueur-Almonds.—Almond-shaped liqueur-bonbons, which contain a syrup, are enveloped with the white mixture in the same way as smooth-comfits; but, in order that they may not be destroyed in the operation, they are first covered with gum-mucilage, and then thrown into a mixture of gum-arabic and sugar reduced to a fine powder: they are afterwards dried, and again submitted to the same operation as often as is necessary to produce a coating of the desired thickness.

Solid Sugar-bonbons are cast in the same way, but with a much stronger syrup.

Gum-Drops.—Gum raspberries are made of syrup and gum-mucilage; they are cast in the same manner, and dried to an elastic solid.

Fondants, which melt like ice in the mouth, are likewise run into starch-moulds: they are composed of a syrup, which is first evaporated to a certain point of concentration, and then beaten until it forms a frothy paste.

Crystallized Bonbons.—All the different kinds of sweetmeats hitherto described

are sometimes covered with a crystalline coating of sugar, by putting them into a strong syrup contained in shallow trays placed on shelves in a drying-chamber heated by steam. A piece of linen is laid on the surface of the syrup to prevent its forming a crust; and by lifting this linen from time to time, the progress of the operation is ascertained: this usually occupies from one to two days. The excess of syrup is drained off in the same room, as soon as the sweetmeats are sufficiently covered with crystals of sugar; they are then removed and air-dried.

Flowers, Piping.—All piped-ornaments are composed of a mixture of white of egg and sugar, which is called "glazing." For the modelling of flowers the workman uses a series of supports which, at the upper part, are of such a shape that they would nearly fit the under side of the flower; a depression being made in the summit to suit the shape of the calyx. The modelling-tools consist of a series of small funnel-ends not much bigger than a thimble, with openings of various shapes as, for example, narrow slits of different breadths, and round and other shaped holes of various sizes. These funnel-ends are fastened with gum to the bottom of paper funnels, into which the workman places the glazing, and then closes the funnel by doubling over the paper. By pressing the paper funnel with the thumb, he squeezes out just what he requires; and by dexterous manipulation, curls and twists it into any form he chooses. This operation is called piping, and is much employed in ornamenting bride-cakes.

Painted Bonbons.—Bonbons intended to be painted are covered with a layer of glazing, and are then ornamented with coloured piping. The last finish is given by painting them with body-colours, mixed with gum-mucilage and syrup. The nature of the colours will be described hereafter in speaking of the contributions from France.

Manufacture of Chocolate—Confectionary.

The following is the method practised by the Paris Chocolate Company, who in Class VI. have exhibited their machinery, which was made by M. G. Hermann, of No. 92 Rue de Charenton, Paris.

The cocoa, or cacao nuts, are first screened to remove any dust, and are then roasted in a cylindrical or globular vessel, which revolves over a fire; the operation of roasting being one requiring much care and attention. After roasting, the husk is beaten off by means of a winnowing-machine. The roasted nuts are now placed in a tritulating or mortar mill, encased with an outer jacket, and heated to 50° C. (122° F.) by means of steam; by the action of this machine they are reduced to a thin paste, on account of the large quantity of oil which they contain. Sugar previously separately ground in a similar, but cold, mill, is now added, and the action of the hot-mill continued until it is well mixed with the cocoa-paste; vanilla is also added if the chocolate is to be flavoured with it.

The thick paste of sugar and cocoa is then levigated to the utmost degree of fineness by means of a mill formed of three rollers working in a horizontal plane; the second cylinder revolving at twice the speed of the first, and the third at twice the speed of the second. The chocolate-paste is put into a long funnel or "hopper," fixed over the two first rollers, which draw down a certain quantity on their surfaces, and by their mutual pressure, and difference of speed, spread it into a thin and even coating. The third roller, by working at a still quicker speed,

produces a farther grinding of the paste, which is scraped off by a ductor-knife and returned once or twice to the mill. A coil of steam-pipes placed under the machine prevents the cooling of the paste during the operation.

The manipulations of chocolate for confectionary are very similar to those already described for sugar-confectionary.

UNITED STATES OF AMERICA.

The preservation of soft fruits in brandy is an art of some importance in the United States, and one which every year is becoming better understood. The peach is the favourite conserve, large quantities of which are annually prepared, chiefly for home-consumption; but from the experience which the Exhibition has afforded of the possibility of sending them to England in a state of perfect preservation, there is but little doubt that they will soon traverse the Atlantic. The white Heath-peach is that deservedly most esteemed. Two American Exhibitors have sent Brandy-peaches.

BRITISH COLONIES.

Canada sends an unimportant contribution of confectionary, consisting of Horehound-candy, reputed in Canada to be a most excellent specific for a cold; a merit which an experiment did not confirm: and also another of Raspberry-vinegar.

From the *Cape of Good Hope* there is a collection of several kinds of conserved Fruits, which for the most part were found to be in a good state of preservation. Some are in syrup, and others partially dried. *Van Diemen's Land* has contributed Raspberry- and currant-jam, Green gooseberry-jam, Red gooseberry-jam, and Quince-jam.

CHINA.

The only description of confectionary in the Chinese section is the Finger-citron (*Citrus sarcodactylus*) preserved in syrup. Large quantities of sugar conserves of various kinds are, however, made in China, and it would have been interesting to compare them with those from other countries: jams, jellies, dry-conserves, and syrups, are such as most resemble those of Europe; but beside these, are preserved seeds, as the Millet-seed, roots, for example, the root of the *Nelumbium*, and the young tender shoots of various plants, as the bamboo.

The trade in these preparations is very extensive, both at Canton and Ningpo; and from the town of Foo-tcheou 44,000lbs. were exported during the first half of the year 1846.*

EGYPT.

The contributions from Egypt are very interesting, as representing not only the confectioner's art in Egypt at the present time, but also as offering to our view conserves probably identical with those of ancient history: they consist of Dates preserved in honey, from two Exhibitors; one description is a preserve in clarified white, the other in dark-coloured honey. Beside these, there is a small quantity of Sugar-candy.

* *Etude pratique du Commerce d'Exportation de la Chine*, par Natalis Rondot, pp. 69, 70.

FRANCE.

The preservation of fruit in sugar, and the manufacture of sugar- and chocolate-confectionary, are highly important branches of industry in France; important, not only from the number of workpeople immediately employed in these manufactures, but also on account of several tributary arts connected with them, which occupy even a far greater number. The artist, the lithographer, the colourer, the varnisher, the paper-maker, the pasteboard-maker, the die-sinker, the embosser, the fancy-braid-maker, the gold- and silver-beater, and even the silk-weaver, are all more or less dependent on the demand for fancy boxes and "*cornets*" to contain bonbons and fruit: indeed, the trade of fancy-box-making owes its existence to the wants of the confectioner, who is still its chief patron. Other trades, appreciating the convenience and attractiveness of a pleasing envelope, have adopted boxes for most of their small wares; and "*Cartonnage*" has now become quite gigantic in its development, employing upwards of Two thousand artisans, both male and female. Paris is the chief centre of the manufactories, which for many months towards the close of each year are all busily employed in preparing the enormous quantities of boxes, mostly distributed in a single day, the first of the new year, to the ladies of France. Many of these boxes cost the confectioner from 12s. to 40s. each, and when filled with confectionary, sell at enormous prices. The greater part, however, cost from 2d. to 2s. 6d. The preservation of whole fruits in sugar is carried on chiefly in the southern parts of France, by small collectors, who forward their produce to their correspondents in Paris. The Parisian confectioners then re-select them, cutting some into ribands, rings, and other fanciful forms, and arrange them in boxes for sale. Paris, on the other hand, supplies boxes to the departmental collectors, who put up in them their fruits for exportation. It is mainly owing to the great taste which the French display, not only in the boxes, but also in the arrangement of the fruit, that they have gained almost a monopoly in supplying the world with preserves: the selection of the fruit and its perfect preservation, however, are points which are carefully attended to, so as to perpetuate the reputation of the goods which an attractive exterior first brings into notice. Eight Exhibitors have sent fruits preserved in sugar, chiefly in syrup.

Chocolate-Confectionary is entirely of French invention, and is the kind of sweetmeat most esteemed in France. Its manufacture, however, is chiefly concentrated in Paris, and gives employment to about Four hundred workpeople, the value of the annual produce being 160,000*l.* It is owing to the great attention which the French machinist has bestowed on the construction of the machinery employed in its preparation for the triturating and grinding processes, that the art has been carried to its present high state of perfection. Other nations are adopting French methods, and employing French workmen to attain a similar end. The French confectioner also displays much ingenious skill in casting a great variety of subjects in chocolate, which are usually afterwards covered with preparations of sugar ("glazing"), and coloured to represent the natural objects. The moulds, in which the casting is effected, are made of sheet-copper hammered to the required shape. Fruit, vegetables, cockchafers, spiders, and other insects, are the subjects most frequently produced.

There are Three Exhibitors of Chocolate-confectionary in the French Section.

Sugar-Confectionary is manufactured in France even to a much greater extent than chocolate-confectionary, and is that which is chiefly exported. Paris, the great centre of this branch of industry, employs Seven hundred workpeople, males and females. The wages of the men average 3s. 4d. per day, and those of the women 8d. The value of its annual produce is 280,000*l.* The French confectioner is not a mere manufacturer of shapeless sweets, he is an artist; he studies not only the elegance of form in each bonbon, but also pays the minutest attention to the attractiveness of the grouping, and the correct contrasting of the colours. His ingenuity and invention are inexhaustible; every season he produces some novelty, and for years this competition has continued between himself and his rivals; and yet there is no abatement in his ardour or his success: now his production consists of a new box; now of some intricate interlacing of fruits; now of some wonderful crystallizations; and now of some new mode of concealing the motto: but in most cases his art is exerted tastefully to introduce a looking-glass. No house enjoys a higher reputation in Paris than its single representative of this art in the Great Exhibition.

In 1850, the exports from France, of syrups, sweetmeats, marmalades, jellies, and fruits preserved in sugar amounted to 983,350 lbs., in value 36,000*l.*

The French confectioner is not permitted to employ any substance he chooses, either in the manufacture of his sweets or the colours he uses to adorn them; the Minister of Agriculture and Commerce very properly interfering. He directs that the Prefect of each town shall carry out, in a proper manner, the instructions which have been laid down by scientific men; not only as to the materials employed, but also as to the coloured-papers used to envelope the sweets. These regulations, it will be observed, are very similar to those which were established for the government of the Apothecary-Confectioners of Germany in the fifteenth century; and it would be well if England took a lesson in this respect, and appointed a competent staff of chemists to examine from time to time the sweetmeats which are exposed for sale in the retail-shops.

The following list of colours, allowed by the French authorities to be used by confectioners, may be found of service to makers of sweetmeats in other countries:—

Blues.—Indigo dissolved in sulphuric acid; Prussian-blue; to which may be added Ultramarine, as preferable to Prussian-blue.

Reds.—Cochineal, Carmine, Carmine-lake (provided it contains no vermilion), Brazil wood lake.

Yellows.—Saffron, French-berries, Persian-berries, Quercitron, Turmeric, Fustic, and the aluminous lakes of these substances.

Green is produced of different shades by mixing the various yellows and blues; but no kind of emerald-green must ever be employed, as it is a virulent poison.

Violet.—Logwood alone or mixed with bronze-blue (Chinese blue), in various proportions.

Pansy-colour.—Carmine and Prussian blue; or Carmine and Ultramarine mixed in various proportions.

Colours for Liqueurs. Curaçoa is coloured with Brazil wood; blues are made with indigo prepared by adding alcohol to the sulphuric solution of indigo; and absinthe (wormwood) is tinted with a mixture of saffron and alcoholic indigo.

INDIA.

India sends a few Preserved-fruits, amongst them some pine-apples ; but they have not arrived in good condition.

PORTUGAL.

There are as many Exhibitors of Conserved-fruit in the Portuguese as in the French Section, and the fruits leave nothing to desire in their preparation ; but the Portuguese do not display the same taste in their arrangement, and lack for that purpose the charming paper-boxes which render the French fruit so presentable ; hence the commerce in this article is much less flourishing than in France. The exports of Portugal are principally to Russia and Brazil ; but a fair proportion comes to England. The preservation and arrangement of fruits are principally carried on in the nunneries, excepting only in the town of Evora-Elvas, which has lately taken a great start, and established regular manufactories. Eight Portuguese Exhibitors have contributed conserves ; and One other a small quantity of comfits..

PRUSSIA.

One Exhibitor sends most excellent Preserves in Syrup. These conserves are an evidence that the art is perfectly understood in Prussia, and carefully practised. There is, likewise, an Exhibitor of Chocolate-confectionary, whose productions, however, are far behind those of France.

RUSSIA.

From this country there has been sent a small collection of various Crystallized-fruits and marmalades, prepared in the Government of Smolensky. The collection comprises oranges, green-gages, apples, cherries, bergamotte-pears, pine-apples, and marmalades of different kinds. Though no Award has been made for these conserves, which had somewhat suffered, there was sufficient evidence of their having been so well preserved as to warrant a favourable notice being given of them in this Report.

SARDINIA.

From the Duchy of Genoa, several preserved Fruits in Syrup, crystallized sugar conserves, and a small quantity of *Dragées*, are sent by One Exhibitor, G. ROMANENGO ; but, unfortunately, the bottles were so insecurely packed that the syrup had oozed out, which left the fruits in a bad condition ; the fruits in boxes are, however, excellent. The comfits are well made, but not equal to those exhibited in the French Department. The conserves of the Sardinian States are much esteemed, and form an important and increasing article of commerce. In the Duchy of Genoa there were, in 1843, 34 confectioners, who employed 146 workpeople, and produced 637,190 lbs. of sugar conserves, valued at 34,400*l.* ; in 1846, 34 confectioners, who employed 150 workpeople, and produced 661,457 lbs. of sugar conserves, valued at 36,000*l.* ; in 1847, the value of the conserves was 48,000*l.* ; in 1848, the value of the conserves was 46,800*l.* In 1843, there were also Twelve establishments for preserving fruits in the province of Nice.

SAXONY.

The contribution from this country consists only of a very large collection of Chocolate-figures, modelled with skill; several of the comic subjects are, however, of rather questionable propriety. The quality of the chocolate of which they were composed did not warrant an Award in favour of the Exhibitor, though he had made considerable exertions to produce a good display.

SPAIN.

Several kinds of Fruit preserved with sugar and dried, and others in syrup, are sent from Spain by Two Exhibitors. These conserves are partly prepared in the convents, and partly in private manufactories. The quality of the fruit is unexceptionable; but in Spain, as in Portugal, there is felt the want of ornamental boxes, in order to set it off to the best advantage.

SWITZERLAND.

One Exhibitor sends a small quantity of Chocolate-lozenges of fair quality.

TUNIS.

The only contribution from this country is a small quantity of a sweetmeat, called *Kefta*, which is made of the dried juice of the grape, and is not unpleasant in flavour.

TURKEY.

No distinct Award has been made for the sweetmeats supplied from this empire, which are very numerous; for the reason before stated in speaking of soap and candles. The Turkish confectionary has, in many cases, the peculiarity of being flavoured either with musk or otto-of-roses. The most remarkable is a sweatmeat called *Rahatlocoum*; it is composed of one part of wheat-starch, six parts of sugar, and twelve parts of water; these are boiled together for some time, and when the mixture has lost so much of the water by evaporation that it will congeal to an elastic jujube-like mass, it is run into a flat tray and allowed to cool: sometimes blanched-almonds are mixed with it. This preparation, which is of agreeable flavour, is in great repute amongst the Turkish ladies, from its alleged property of developing those proportions of figure which, in their country, are deemed a most essential attribute of female beauty. About 600 tons of *Rahatlocoum* are made annually in Turkey.

The following Conserves also find a place in the Turkish collection: *Kufta-anjou*, prepared from the dried juice of the grape; *Kufta-anjou* with blanched almonds; *Pastia*, which is also prepared from grape-juice dried quite hard in thin scales; the pulp of the Persian prune (this has by no means an agreeable flavour); pistachio-nut-comfits; roots preserved in sugar and flavoured with musk; very good marmalade of plums; sugar-candy, pink and white; liquorice-syrup; and lastly, dried liquorice-juice. Of all these the most agreeable is without doubt the *Rahatlocoum*.

UNITED KINGDOM.

ENGLAND derives her supply of fruits preserved in sugar from countries more favoured than herself in climate, large quantities being annually imported from France (chiefly), Spain, Portugal, and her various colonies. The weight of fruits preserved in sugar or brandy, imported from all parts, during the year 1850, was 155,895 lbs., and yielded in duty 3,754*l*. There is One Exhibitor of foreign Preserved-fruits in the British Section. English jams, jellies, and orange-marmalade, which are prepared very largely throughout the United Kingdom, are not exhibited, probably under the idea that no interest would be attached to them.

Confectionary is manufactured, in enormous quantities, throughout the United Kingdom, and more particularly in Scotland. It is not possible to arrive at an exact knowledge of the quantity annually produced, nor even to make a tolerably accurate estimate as to its extent; but it is certain that two or three tons per week of lozenges are not an unusual produce for one house. From the result of inquiries amongst the sugar-brokers and confectioners, it may be safely stated that upwards of 150 tons of sugar are converted, every week, into sweetmeats; at 47*l*. per ton, the raw material used in one year, therefore, amounts to 366,600*l*., to which must be added labour, flavouring, and a wholesale and retail profit. Besides this, 31,977 lbs. of Confectionary are annually imported, and pay a duty of 840*l*.

The manufacture of Chocolate-confectionary is only of recent introduction into England, and is carried on by Frenchmen and Italians, Two of whom exhibit their apparatus at work in Class VI. There are Three Exhibitors of Chocolate-confectionary in the British Department, One of whom exhibited chocolate quite equal to that made in France.

Crystallized Liqueur-confectionary, similar to that of France, is now made largely in England, and is quite equal in quality, but at a considerably less price than the French. This arises, to some extent, from the difference in the price of sugar, and also because the cane-sugar is more easily worked, or, as the workman expresses it, is stronger. For example, crystallized liqueur-beans, *dragées*, and "drops" of English manufacture, are sold wholesale at 8*d*. per lb., the price in France being 1*s*. 3*d*. As wages are considerably higher in England, the difference in price is the more remarkable.

By far the larger portion of sugar annually devoted to sweetmeats, is carried off by "pipe," lozenges, and comfits of different kinds. The latter description is made chiefly in Scotland, which has long been renowned for its confectionary. Machinery is employed, particularly in the manufacture of lozenges, acidulated-drops, and comfits, so that the wholesale-confectioner is enabled to sell these kinds at prices but little above those of the raw materials; notwithstanding this, an unfair competition seeks still farther to diminish the price by admixtures of powdered gypsum. The acidulated-drop is a production peculiar to this country, the foreign confectioners not understanding its manufacture.

Bride-cakes are not wanting in the World's Great Show, nor should they be; for they are characteristic of English tenacity with respect to ancient customs, and few are older than the use of bread or cake at marriage-ceremonies, which, with the wedding-ring, has been derived from the heathens. The sprinkling of wheat on

the head of the bride is a very old custom, and is now occasionally perpetuated by the cutting of the cake over her head. Many other ceremonies are also still retained in connection with the bride-cake; as the passing of very small pieces of it nine times through the bride's ring, in order that the bridesmaids may place a piece beneath their pillows at night and dream of their lovers. No less than Three gigantic Bride-cakes adorn the counters of the North Transept Gallery, varying in value from 30*l.* to no less a sum than 150*l.* One, it is said, possesses the advantage of moveable ornaments, so that after the cake has disappeared, the sugar may be transmitted, like the silk-dresses of our ancestors, as an heir-loom from the grandmother to her granddaughter! The Three Exhibitors are R. GUNTER, MOORE and MURPHY, and R. VINE. Although these bride-cakes were not considered of sufficient importance in a mercantile point of view to warrant the Jury in making them the subjects of a distinct Award, they are here mentioned as being the best of their class. The sugar-ornament of the last named is quite remarkable as a piece of "sugar-piping."

The number of British Exhibitors of Sugar-confectionary is Eleven. There are likewise Two Exhibitors of Confectioners'-ornaments, and Three Exhibitors of Biscuits.

WURTEMBERG.

To judge by the contributions to the Exhibition, the forte of the Wurtemberg confectioners is rather in the production of non-edible ornaments than confectionary itself; there being Three Exhibitors of the former, and only One of the latter. The confectionary which is crystallized is, however, excellent.

The number of Exhibitors in this subdivision is Sixty-six, of these there are :—

17 Holders of a Prize Medal.
5 Who obtained Honourable Mention.
44 Unrewarded.
—
66
—

The classification of Exhibitors, according to the various countries, is as follows :—

America - - - - -	2	Russia - - - - -	1
British Colonies :—		Sardinia - - - - -	1
Canada - - - - -	2	Saxony - - - - -	1
Cape of Good Hope - - -	1	Spain - - - - -	2
Van Diemen's Land - - -	1	Switzerland - - - - -	1
China - - - - -	1	Tunis - - - - -	1
Egypt - - - - -	2	Turkey - - - - -	1
France - - - - -	13	United Kingdom - - - -	20
India - - - - -	1	Wurtemberg - - - - -	4
Portugal - - - - -	9		—
Prussia - - - - -	2	Total - - - - -	66
	—34		—

Of these, Thirty exhibit Fruits preserved in syrup or brandy: Eighteen exhibit Sugar-confectionary; Nine, Chocolate-confectionary; and Five Confectioners' ornaments; the remaining Four exhibit sweet-biscuits.

LIST OF AWARDS.

ALVARGONZALEZ, R., Oviedo (Spain, No. 177). Prize Medal. Fruit exceedingly well preserved in syrup; comprising Greengages, Peaches, Apricots, and Strawberries.

AUCLERC (Widow), and P. LEDOUX, Paris (France, No. 1059). Prize Medal, for an assortment of French Comfits, Liqueur-bonbons, and *Pastillage*-figures (composed of sugar and white of egg, or sugar, gum, and starch). The bonbons are arranged with great taste in fancy boxes and *corbeilles*, and much skill is displayed in the modelling of the pastillage-figures.

BAUR BROTHERS, Biberach (Wurtemberg, No. 87). Prize Medal, for a very extensive collection of Confectioners' ornaments, many of which are very humorous. They are composed of gum-tragacanth, and starch, so that if eaten no ill effects would arise, but they are intended only as ornaments. The largest piece represents the Cathedral of Cologne, and contains a musical-box. In Germany, storks are reputed to bring newly-born infants, and we find, accordingly, one of these birds carrying a child in a small box strapped on his back.

CASTELLAR, F., Lisbon (Portugal, Nos. 422 to 425, 426, 428 to 433, 438). Prize Medal. Figs, Plums, Peaches, and Pears as dry conserves; Sweet-Plums, Apricots, Tangerine-oranges, Figs, Cherries, and Peaches preserved in syrup with their natural flavour and perfectly sound.

CHEVET, jun., Paris (France, No. 121). Prize Medal. Cherries, Pears, Apricots, and other fruits preserved in syrup. These are of the highest class, both as regards the choice of fruit and careful preparation.

COIMBRA, THE NUNNERY OF (Portugal, No. 417). Prize Medal, for a large and tastefully arranged box of Conserved-fruits in great variety, and in the highest state of perfection.

FORTNUM, MASON, and Co., Piccadilly (Class III., No. 55). Prize Medal (*the same Award by the Jury of Class III.*). A very extensive collection of the finest Preserved-fruits of various countries. For the care bestowed in the selection and arrangement of this (the largest) collection of costly conserves, the Jury has awarded the Prize Medal.

LOUDERBACK, M. J., Cincinnati (United States, No. 7). Prize Medal. White or Heath-peaches preserved in brandy, of delicious flavour, and in a perfect state of preservation. The name Heath is derived from the surname of the grower who first introduced them.

LOUDARD, L., SON, and BOUCHEROT, Paris (France, No. 1374). Prize Medal, for the care in selecting, and taste in arranging, in ornamental forms and in boxes, a great variety of Preserved-fruits; and for Comfits and Sugared-almonds of excellent quality.

PARIS CHOCOLATE COMPANY, Regent Street (Class III., No. 30). Prize Medal, awarded for most excellent Chocolate-confectionary in a great variety of forms; all of which was found to be carefully prepared and well flavoured; and also for an assortment of Syrups, which on dilution form very agreeable and refreshing beverages.

PERRON, E., Paris (France, No. 343). Prize Medal (*the same Award by the Jury of Class III.*). Chocolate-confectionary, prepared in granite mills, and torrefied by

steam. This preparation is exhibited in a great variety of forms; amongst other matters, there is a Basket made of chocolate, filled with Chocolate-bonbons, which are well flavoured and are of most excellent quality.

PHILIPPE and CANAUD, Nantes (France, No. 956). Prize Medal. Excellent Fruits preserved in syrup, and comprising Peaches retaining the delicacy of their flavour, Pears, Raspberries, and Cherries, all of which are free from any signs of fermentation.

RODEL and SONS, Bordeaux (France, No. 992). Prize Medal, for a collection of the following fruits, perfectly preserved in syrup, viz.:—Cherries, Pears, Apricots, Greengages, Raspberries, Peaches, and Strawberries, which have retained their natural flavour, and are free from fermentation.

ROTH, W., jun., Stuttgart (Wurtemberg, No. 89). Honourable Mention, accorded for a large collection of well-manufactured Liqueur-bonbons, both crystallized and smooth.

ST. PELAYO, THE NUNNERY OF, Oviedo (Spain). Prize Medal, for a collection of Marmalades of excellent flavour. They are of firm consistence, and are packed in thin round boxes.

SCHOOLING, H., Bethnal Green (Class XXIX., No. 114). Honourable Mention,* for Liqueur-bonbons agreeably flavoured and in every respect well-made, crystallized and smooth, generally known as French sweetmeats. Some of these are flavoured with artificial essences. (See pages 1347, 1348.)

TRÖGLEN, G., Ulm (Wurtemberg, No. 91). Honourable Mention is accorded to this Exhibitor, for a Confectioners' ornament, representing a Lion-hunt, well modelled in gum-tragacanth, sugar, and starch, and coloured with vegetable-colours.

TURPIN, F. A. (Widow), Paris (France, No. 1046). Prize Medal (*the same Award by the Jury of Class III.*), for a large collection of very excellent and carefully prepared Chocolate-confectionary, made up into *dragées*, and representing fruits and roots; for instance, potatoes, nuts, chesnuts, turnips, radishes, dates, black currants, hips, and plums; all of which are imitated with skill.

VOLSTEEDT, J. P. (Cape of Good Hope, No. 35). Honourable Mention is accorded for the following conserves, which are exhibited both in syrup and in the candied state, viz.: Nartjes (a small orange), the Bitter-orange, Green-figs, and Citrons.

WEATHERLEY, (H. Class III., No. 27). Honourable Mention. Sugar-drops, flavoured with artificial essences or compound-ethers, designated by names derived from their resemblance to the savour of various fruits; as essence of pear, of pineapple, &c. (See pages 1347, 1348.) The major part of these drops are flavoured with a single compound-ether, but in some cases a combination of several is used.

WEILL, C., Berlin (Prussia, No. 20). Prize Medal (*an Honourable Mention accorded by the Jury of Class III.*). Whole Pine-apples, Peaches, Apricots, Pears, Plums, and Walnuts in the husks, preserved in syrup. The soft fruits have retained their natural flavour, and are quite free from fermentation.

* But for a misstatement contained in a label attached to these productions, by which it was made to appear that they were manufactured in France under the immediate inspection of the proper authorities, a Prize Medal would have been awarded to Mr. Schooling. The Reporters are now enabled to state that the employment of this label has been discontinued.

WOTHERSPOON, J. and Co., Glasgow (Class XXIX., No. 106). Prize Medal. Very excellent Scotch-confectionary, manufactured by steam machinery, and consisting of eighteen kinds of Lozenges and several descriptions of Comfits, which were found to contain no other material than sugar, starch, and vegetable-colouring.

B.—MANUFACTURES RELATING TO NATURAL HISTORY.

I.—ARTIFICIAL FLOWERS AND FRUIT.

Under this general designation two very distinct classes of articles have to be separately considered, namely, Imitative Flowers and Fruit, modelled in wax, and the same subjects formed from other materials. The Wax-flowers, from their fragility, are chiefly restricted in their application to purposes of decoration, and require less difficult manipulations for their successful production than those made of cambric, feathers, or similar materials, and destined for more general application. Wax-flowers are, however, occasionally used as articles of toilet.

In examining the Wax-flowers, which are usually intended to form isolated ornaments, we require truthful imitations of Nature, and taste in the selection of forms or grouping, the manufacturing skill required resolving itself almost wholly into the execution of form and the application of colours.

In the latter class, however, are included those productions to which the term "Artificial Flowers" is usually more especially applied; and it presents other qualifications besides those offered by the flowers modelled in wax, the artistic merits being more closely connected with the process of their manufacture. Accuracy of form and colour, and taste in the choice of examples and in the grouping, are of equal importance in the work; and there is usually more skill required for the imitation of the natural texture: but in addition to these qualities we have also to consider other peculiar excellencies of the articles produced, such as durability, the advantageous application of varied materials, and, finally, cheapness of production.

Such are the principles by which we have been guided in the examination of the several specimens of Artificial-flowers submitted to the Jury of this Class.

AUSTRIA.

The contributions from Austria are sent by Two Exhibitors, both of whom display small collections of cheap Miniature-flowers, in which the trifling cost is the chief merit.

BRAZIL.

The contributions from Brazil are only four in number, and undoubtedly the most beautiful of them is that belonging to Class XXIX., consisting of a splendid Bouquet of Feather-flowers, including the Coffee-, Cotton-, and Tobacco-flowers, &c. The name of the manufacturing artist was not stated; but an Award has been made in favour of the Exhibitor, who is an Englishman resident in London.

BRITISH COLONIES AND CHANNEL ISLANDS.

Many of the examples exhibited by the Dependencies of Great Britain have an especial and a very high interest attaching to them, since they may be supposed

to represent with sufficient accuracy a great variety of plants and fruits generally unknown in Europe. The Jury have not rewarded them as works possessing great artistic merit, but they nevertheless fully appreciate the laudable desire to impart information evinced by the numerous Colonial Exhibitors who have contributed the several specimens they record.

Bahama Islands.—The Misses GREIG send a bouquet and a vase made of brilliant shells, and Mrs. E. BARNETT, an important and very interesting collection of Thirty-two Wax models of Fruits, which appear to have been made and coloured with minute attention to accuracy in the imitation of Nature. But by far the most important contribution of this description is displayed by Three Exhibitors in the *Barbadoes* Department; though the whole of the specimens appear to have been executed by Mr. and Mrs. BRAITHWAITE, who are residents of that island. These examples, which are upwards of a hundred and fifty in number, comprise Bulbs, Roots, Plants, Flowers, Fruit, and Seeds, and reflect much credit on the modellers, for their attention to correctness of detail, a point of far greater importance than artistic grouping, when the intention, as in the present instance, is to convey a correct idea of the objects represented. *Guernsey* sends a small stand of Wax-fruit. *India*. The examples which have been collected from Gokak, in the Mahratta country, Travancore, and Rohilkund, comprise models of about seventy varieties of Flowers and Fruits. Although possessing but little artistic merit, these numerous specimens form a most interesting and instructive display. *Jamaica*. Mrs. NASH contributes several ornamental groups of flowers made of the fibres of the Yucca or Dagger-plant. *Malta*. ANTONIO GERADA and his DAUGHTERS exhibit a basket of rich Shell-flowers. *Mauritius*. The COUNTESS GREY sends a basket and Wreath of Flowers from the Séchelles Islands, made of Palm-leaves; and Madame CHAPON and the Mdles. GANCOURT contribute several Bouquets in Shell-work.

FRANCE.

It must be conceded that the manufacture of Cambric-flowers is a purely French, or, to speak more correctly, a Parisian art; for although its origin is Italian, and that it is now carried on in other countries, the productions are usually copies from French models. Indeed Cambric flower-making as much belongs to Paris as the manufacture of silks to Lyons, or ribbons to St. Etienne: and, to extend the parallel even still farther, as cotton to Manchester or cutlery to Sheffield. The importance of the manufacture of cambric flowers will be better appreciated when it is stated that the value of these productions, in 1847, was 442,226*l.*; and notwithstanding the high import duties of 25 per cent. in England, of 33 per cent. in the United States, and of 40 per cent. in Russia, that French-made flowers to the *declared* value of 68,000*l.** were exported in the same year, principally to those countries, namely,—to Belgium 12,400*l.*, to the United Kingdom 12,120*l.*, to the United States 17,600*l.*, to all other parts 25,880*l.* No branch of industry presents a more complete instance of the subdivision of labour than artificial

* It is estimated that the *selling* value is nearly double this sum.

flower-making. Few of the manufacturers carry on all the operations on their own premises. Besides the cambric, muslin, gauze, velvet, silks, &c., supplied from Lyons, St. Quentin, and St. Etienne, there have been distinct manufactories established for many others of the component materials of these graceful ornaments. Thus the Dyes and Body-colours are prepared expressly for this art by manufacturing chemists; the materials, as Coloured-Papers, Buds, Leaves, Stamens, Pistils, Fruits, and similar articles, are usually made in workshops devoted exclusively to their production; and in some instances, as may be seen by the contributions to the Exhibition, only one description is made in one manufactory. In 1847 there were Forty-eight manufacturers of such materials in Paris, who employed 478 workpeople, and produced goods valued at 47,156*l*. The flowers are composed from their separate component parts in other workshops, some of which have a reputation for one kind only; and lastly, the grouping together of the various flowers is effected in the warehouses of the vendors, who are termed "*monteurs*," of whom, in 1847, there were 574 in Paris, who employed 5,675 workpeople, and produced goods to the value of 395,070*l*. It must, however, be stated, that there are some manufactories in which by far the greater number of these operations are carried on. In most cases, however, each workshop is restricted to the exercise of some particular branch. This will be more readily understood when it is stated that there are no fewer than Six hundred and twenty-two manufactories in Paris (including the forty-eight preparers of materials before named), which on the average annually produce goods amounting in value to 711*l*, supposing the total production equally distributed between them; but this is far from being the case, for in 1847,—

12	returned	.	.	.	8,000 <i>l</i> .
8	, ,	from	4,000 <i>l</i> .	to	8,000 <i>l</i> .
33	, ,	, ,	2,000 <i>l</i> .	, ,	4,000 <i>l</i> .
63	, ,	, ,	1,000 <i>l</i> .	, ,	2,000 <i>l</i> .
131	, ,	, ,	400 <i>l</i> .	, ,	1,000 <i>l</i> .
104	, ,	, ,	200 <i>l</i> .	, ,	400 <i>l</i> .
182	, ,	, ,	40 <i>l</i> .	, ,	400 <i>l</i> .
89	, ,	less than	-		40 <i>l</i> .
622					

In 1847 there were 6,153 workpeople employed in cambric-flower making, namely:—

414	men.
5,063	women.
19	boys, from 6 to 16 years old.
657	girls ditto ditto.
6,153	

The men earn, on the average, 3*s*. per day, the women 1*s*. 7*d*. per day: the youths and girls, being mostly apprentices, receive, in most cases, no remuneration beyond their board and lodging.

Two of the Exhibitors, M. Constantin and M^e. Fürstenhoff, contribute specimens which show to what a surprising degree of perfection the imitation of nature may be carried in this art. Indeed, the productions of M. Constantin are so perfect

that they will allow of the scrutiny of a magnifying lens. In one instance, during the examination of his case, it was so doubtful, even with the aid of the glass, whether a real object had not been used, that the Exhibitor pulled a specimen to pieces to convince the Jury. Both M. Constantin and M^e. Fürstenhoff are, it appears, accomplished botanists, having followed regular courses of scientific study; and no higher proof could be afforded of the value of such training than the examples they display. It is productions such as theirs that have stimulated the manufacturers of articles of more general sale to improve their goods, by imitating, so far as is consistent with cheap production, the excellencies brought before them from time to time at the French *Expositions*. These periodical displays, by producing a healthful rivalry among the "*monteurs*," in the tasteful selection and grouping of the various flowers and leaves for articles of dress, have, in this respect also been of most essential service in developing the capabilities of this important trade. For however meritorious and commendable the truthful imitation of plants may be, this excellence is insufficient of itself to induce a large home consumption, or to create and maintain an extensive export trade. It is to the great talent of the Parisian "*monteurs*," in harmoniously grouping together a variety of stems, leaves, buds, and flowers, for head-wreaths, dress-trimmings, and bouquets, as much as to the skill of the makers of these flowers, that Paris owes its high reputation in this art; and so much diversity as to skill exists among the various artists, that it is known that the *same* flowers have a double value when arranged by one, to what they would have if by another of them.

HAMBURG.

The contribution consists of a Frame of Artificial Flowers, which does not call for any especial comment.

HESSE DARMSTADT.

Flowers and Fruit, modelled in wax, contributed by One Exhibitor, are average productions of their class.

MEXICO.

The contributions from Mexico comprise a few examples of Wax-flowers and Wax-fruit.

NASSAU.

A few specimens of Wax-fruits form the only contribution from Nassau in this Department.

PORTUGAL AND MADEIRA.

The Portuguese Department contains some excellent specimens of Cambric-flowers, partly contributed by M. CONSTANTIN, who, under his real name of MARQUES, pays this tribute to his native country. From the Island of Madeira are displayed specimens of those very beautiful Feather-flowers, for which it is so justly renowned. They are executed principally in the NUNNERY OF SANTA CLARA, in favour of which an Award was made. Other specimens are exhibited

in the North-East Central Gallery, contributed by an English Exhibitor. There is also an extensive series of Wax-fruits from H. FERRAZ and his SISTERS, which deserve favourable notice.

SWEDEN.

Madame FÜRSTENHOFF, whose beautiful productions have been spoken of under the notice of France, adorns the department apportioned to her native country with a selection of her admirable imitations of Nature.

UNITED KINGDOM.

As the French may be regarded as superior in the construction of Cambric-flowers, so the British surpass all other Exhibitors in the manufacture of Wax-flowers. This is indeed as truly a British manufacture as the making of Cambric-flowers is French. In many instances those who practise the art are ladies, who having first acquired it as an accomplishment, subsequently devote their leisure to its pursuit; but it is also executed by those who follow it as a profession. The remarks which have been already made respecting the productions of two of the French Exhibitors may with equal truth be repeated here in regard of the contributions of the MINTORNS and Mrs. STRICKLAND. In their productions even the minutest details of the plants are represented with microscopic truthfulness; and in all there is evinced an amount of careful and patient study deserving of the highest praise. In respect also of the examples displayed by the other Exhibitors, it is not too much to say that there are but few which could be said to possess only an ordinary degree of merit.

In the making of Cambric-flowers the aim of the British artists has not been so high, and although meritorious commercial articles are rewarded, still the generality of the contributions are below those of the same species in the French Department. At present a large quantity of the better description of cambric-flowers is imported annually into the United Kingdom. In 1850, for example, the imports amounted in value to 61,634*l.*, and 15,409*l.* were paid for the duty upon them.

Shell-flowers, Wax-fruit, and, lastly, Feather-flowers, find a place in the British contributions to Class XXIX.

WURTEMBERG.

The contributions from Wurtemberg, which are creditable, are from Two Exhibitors, one of whom sends materials for flower-making, and the other finished flowers made of cambric.

There are Seventy-four Exhibitors of artificial flowers and fruit; of these there are—

- | | |
|----|----------------------------------|
| 1 | Holder of a Council Medal. |
| 16 | Holders of a Prize Medal. |
| 10 | Who obtained Honourable Mention. |
| 47 | Unrewarded. |

—
74

The classification according to the various countries is as follows :—

Austria - - - - -	2	France - - - - -	15
Brazil - - - - -	1	Hamburg - - - - -	1
British Colonies and Channel Islands :—		Hesse - - - - -	1
Bahamas - - - - -	2	Mexico - - - - -	1
Barbadoes - - - - -	3	Nassau - - - - -	1
Guernsey - - - - -	1	Portugal (3), and Madeira (1)	4
India - - - - -	1	Sweden - - - - -	1
Jamaica - - - - -	1	United Kingdom - - -	34
Malta - - - - -	1	Wurtemberg - - - - -	2
Mauritius - - - - -	2		
	— 11	Total - - - - -	74

The Seventy-four Exhibitors admit also of classification according to the nature of the articles which they have contributed, in the following arrangement :—19 Exhibitors of Wax-flowers ; 14 of Wax-fruit ; 6 of Materials for Cambric-flowers ; 17 of Cambric-flowers ; 1 Exhibitor of Crape Mourning-flowers ; 5 Exhibitors of Feather-flowers ; 5 of Shell-flowers ; 6 of flowers of other materials, as Braid, Rice-paper, Palm-leaves, Spun-glass, and Beads ; and 1 Exhibitor of flowers, for Table-decorations, cut out of turnips.

LIST OF AWARDS.

ADAMSON, O. G., Panton Street, London (Brazil, No. 1). Prize Medal, for a very large and elaborate group of Brazilian flowers, executed in Feathers obtained from the plumage of Brazilian birds. It exhibits wonderful brilliancy of colour, and much accuracy of form. The mechanical execution is very good, and much taste has been displayed in the arrangement of the bouquet.

BRETEAU, C., Paris (France, No. 1112). Honourable Mention, for Artificial Flowers, Plumes, &c. These decorative articles are of good quality, and well designed.

BÜRGER, J., Vienna (Austria, No. 700). Honourable Mention, for a collection of Miniature Artificial-Flowers. This collection is chiefly noticed as containing examples of a manufacture which is carried on rather extensively in Catholic Germany. The specimens do not possess any high artistic merit, since they are cheap products for commercial purposes.

CHAGOT, A., sen., Paris (France, No. 1139). Prize Medal, for Feathers, Bouquets, Artificial Flowers, and Vases. Manufactures of a more common class than most of the other collections, and intended to supply large consumers and the export market, for which they are good and well executed. The colours and grouping, as is usual in French articles, are of a superior character.

CHISHOLME, EMMA, Edward Street (Class XXIX., No. 78). Honourable Mention, for Wax-flowers botanically accurate, especially a group of *Orchidaceæ* ; a Rose-tree is also executed with much skill. This is, on the whole, a very creditable collection.

CONSTANTIN, J. MARQUES, Paris, and Regent Street, London (France, No. 94). Council Medal, for a large case in the Area of the East Nave, and a case in the South-East Gallery. The productions of this maker are of the very highest quality, and the imitations of entire plants in the large case display not only great

skill in construction, but so intimate a knowledge of their botanical character as to render them available for purposes of instruction as well as decoration. The material of which they are made is chiefly cambric, with which the imitation of texture is most successful. For general truth and natural character, especial attention may be drawn to the Prince's-feather, Sun-flower, *Aristolochia*, and other plants of intricate conformation, which are productions of the first order in this class of objects. Most deserving of commendation, also, is the admirable skill with which are portrayed the several stages in the development of plants, from the budding blossom to the decaying flower, from the opening leaflet to the fallen and withering foliage: even accidental fractures are delineated with surprising truthfulness. The case in the Gallery contains a collection of Flowers, Wreaths, Bouquets, &c., of similar construction, but of less elaborate work, and more adapted for general purposes. These flowers are not only characterised by the same kind of excellences as the others, but in their manufacture a solidity and durability of high importance have been secured. (See *Prefatory Remarks*, p. 1335.)

DORVELL, ELIZABETH, Oxford Street (Class XXIX., No. 77). Prize Medal, for Wax-flowers. The groups in this collection are most exquisite, from the tasteful selection of subjects and the arrangement of colours. The flowers are well made and very accurate. The model of the *Victoria Regia* is also good.

EWART, HENRIETTA, Bath Place, New Road (Class XXIX., No. 75). Honourable Mention, for Wax-flowers, deserving of commendation for the good selection and arrangement of the subjects of the groups, also for their mechanical execution and botanical accuracy.

FISHER, JOSEPH, Cripplegate Buildings (Class XXIX., No. 80). Honourable Mention, for imitation Flowers in pots, &c. These articles are intended for decorations on a large scale, for rooms, &c., and, therefore, are of a somewhat rougher character than those intended for personal ornaments. There is a degree of stiffness about them, but they are, on the whole, very creditable; more particularly the Fuchsias.

FLORIMOND, —, Paris (France, No. 1224). Honourable Mention, for Artificial Flowers, &c. Artificial Flowers as applied to Head-dresses; Fruits and Flowers. These, though not of the highest class, are deserving of praise for the taste displayed in the grouping.

FOSTER, SON, and DUNCUM, Wigmore Street (Class XXIX., No. 74). Prize Medal, for articles used in the manufacture of Artificial Flowers, Feathers, &c. The materials are good, and brilliantly coloured. Interesting specimens of unfinished flowers are exhibited, illustrating the mode of manufacture. The finished flowers, as well as the feathers, &c., are very beautiful articles, taking a high place among the commercial productions of this class.

FÜRSTENHOFF, EMMA, Paris (France, No. 492A). Prize Medal, for Artificial Flowers, manufactured from muslin and crape, to facilitate the study of botany. There is much merit in this collection, but this depends chiefly upon their beauty and fitness for ornamental purposes; since, although botanically accurate, the examples are chiefly of double and cultivated flowers, which are of inferior value for the purpose mentioned by the Exhibitor.

GATTI, A. and G., Coppice Row, Clerkenwell (Class XXIX., No. 73). Honourable Mention, for Artificial Flowers, and articles used in their manufacture, such

as leaves, buds, and other components of flowers; chiefly of common material, but very good in regard to colour, some of the tints being exceedingly bright and rich. The flowers are extremely accurate in their imitation of Nature, and are mostly well selected for the peculiar class of article. As cheap commercial productions, this collection deserves commendation.

GAUDET-DU-FRESNE, Paris (France, No. 842). Prize Medal, for manufactured leaves for artificial flowers. This collection contains a large assortment of leaves, executed in a peculiar manner; and though restricted to a special branch of the manufacture, is remarkable for the variety and beauty of the specimens, which exhibit a very fair amount of natural character.

HARAND, E., Paris (France, No. 863). Prize Medal, for Head-dresses, Trim-mings, &c. These are very good commercial articles, suited for superior markets, and exhibiting great taste and accuracy in design.

LEFORT, —, sen., Paris (France, No. 1295). Prize Medal, for materials for Artificial Flowers. This maker has produced Papers and Stuffs of most brilliant colours, and in very perfect series of gradations of tint; the paper stained with carthamus-red (safflower) is especially remarkable for the purity and vividness of its colour. These, as well as the more advanced forms of the "materials," such as Leaves, Sprigs, Buds, Berries, or other Fruits, for the construction of bouquets and wreaths, are excellent specimens of a class of manufacture carried on upon a large scale for the supply of a cheap market.

LUMSDEN, J., Trevor Terrace, Knightsbridge (Class XXX., No. 125). Prize Medal for Wax-flowers. An exceedingly graceful and truthful group, executed with much skill and artistic feeling. The colours are chosen with excellent taste, and the effect of the whole is very beautiful.

MAKEPEACE, ELIZA, Manor Place, Clapham (Class XXX., No. 185). Honourable Mention, for Wax-flowers, distinguished by the accurate representation of Nature, and the delicacy and beauty of the colouring. They are exceedingly well adapted for scientific illustration.

MINTORN, JOHN H., HORATIO, ELIZABETH, and REBECCA, Soho Square (Class XXIX., No. 70). Prize Medal, for a very large and beautiful collection of Wax-flowers. The plants in the large case are very accurate and life-like, and well adapted for scientific Museums, to which they are especially suited from the truthfulness with which they represent the botanical characters of the various plants. The *Victoria Regia*; the Ferns showing all their minute fructification; the Mignonette; and the Orchids, are among the numerous instances deserving of the highest praise. The small groups and single flowers are also very elaborate imitations of Nature, and present a beautiful appearance; the colouring, texture, and mechanical finish being of the first class.

PAROISSIEN, A., Paris (France, No. 945). Honourable Mention, for a collection of Waxed Leaves, prepared with considerable attention to accuracy in the imitation of nature.

PERROT, PETIT, and Co., Paris (France, No. 952). Prize Medal, for Artificial Flowers, Feathers, &c. Bouquets and Wreaths, composed of various materials; the Feather-flowers are very beautiful; and the whole collection, including the Feather-ornaments, is very excellent, and affords an evidence of much taste on the part of these Exhibitors, whose productions hold a high rank in the French Department.

RANDOLPH, WILHELMINA, Marsham Street (Class XXIX., No. 66). Prize Medal, for plants imitated in Undyed-feathers. This collection displays much ingenuity and industry. The field to which the maker has restricted herself is somewhat narrow, probably from the difficulty of obtaining brilliantly-coloured feathers; but so far as her attempt extends, she has succeeded remarkably well in representing the natural characters both of flowers and foliage. The Roses, Carnations, and Wall-flowers are highly creditable.

RUSSEL, VINCENTE, Lisbon (Portugal, No. 1298). Honourable Mention, for an Artificial Orange-tree. A very creditable imitation of a small orange-tree, distinguished by more than common truth of general character.

SANTA CLARA (Funchal), THE NUNNERY OF (Portugal). Prize Medal, for a case of Feather-flowers from Madeira, in the Portuguese Department. A very beautiful specimen of this manufacture, which is extensively pursued in Madeira.

STRICKLAND, MARIA, New Bond Street (Class XXIX., No. 63). Prize Medal, for a collection of Wax-flowers. The flowers of this collection deserve the highest praise for their artistic merits. They are exceedingly accurate in form, colour, and texture; in which latter respect a group of Roses may be especially noticed, an uncommon amount of delicacy having been attained in the petals. A bunch of Heaths is equally good. The Model of the *Victoria Regia*, in its various stages of development, is excellent and most life-like.

SUGDEN, BORRAS, and Co., Aldermanbury (Class XXIX., No. 62). Prize Medal, for Artificial Flowers, Feathers, and Head-dresses. The flowers in this collection are especially worthy of notice, as being very superior commercial products for general use. Much ingenuity is displayed in the imitation of textures by various materials, such as Waxed-cloth, Velvet, Muslin, Cambric, &c., and for general accuracy of form and colour, brilliancy of tint, and tasteful selection of subject, they merit strong praise. The Feathers are also exceedingly good.

TILMAN, —, Paris (France, No. 698). Prize Medal, for Artificial Flowers, Head-dresses, &c.; small Groups, Bouquets, &c., in great variety, of very superior quality, as intended for general commercial purposes, combining a fair amount of natural character with good mechanical execution, and much taste in the selection and grouping of the component leaves and flowers. The collection of this Exhibitor is one of the best contributed by the French flower-makers.

II.—TAXIDERMY.

The art of stuffing animals is generally supposed to be an invention of modern date, and to have originated about the period when the various museums of Natural History were founded in Europe; but traces of the art are to be discovered in the earliest records of antiquity, although the methods then employed differ much from those now practised. The procedure of the ancient Egyptians in embalming human remains and dead animals, in some measure resembles the manipulations of the taxidermist; inasmuch as in both the parts peculiarly subject to decomposition are removed, and replaced by more durable materials. But whilst the Egyptian embalmer desired rather to preserve the substance of the body than its form, the taxidermist sacrifices all, except the skin, to the obtaining of a natural representation of the aspect of the living animal. The ancient Greeks and Romans, however, endeavoured to pre-

serve the form as well as the substance of the body, but their methods fulfilled the object very imperfectly. The ordinary proceeding consisted in immersion in melted wax, or in honey: this necessarily disguised the shape, even though it remained unimpaired. Perhaps the best of the ancient methods for the preservation of animal substances consisted in placing them in a solution of common salt; this is still done, though for very different purposes. In this manner the sow, which by bringing forth a litter of thirty pigs, afforded a happy omen to Æneas, was preserved by the priests; and it kept so well that it was said to have been in existence at Lavinium in the time of Varro. In the same way were preserved two hippocentaurs (probably monstrous births), and also an ape, which, having been sent by the Indians to the Emperor Constantius, happened to die on the road.

It appears to have been the business of the priests to preserve rare animals, or rare natural specimens generally, and this was so prevalent, that we are almost tempted to refer the origin of museums of Natural History to the temples of antiquity; indeed Beckmann, in his *History of Inventions*, quotes a number of instances which support this view. And although it cannot be positively* asserted, from the notices in the Greek and Latin authors on the subject under review, that methods resembling those now used by the animal-stuffer were employed by the ancients, still the circumstance that animals were frequently suspended in the temples, shows that they were not invariably preserved *in salt or honey*. The ancients, must consequently have possessed methods of preserving animal substances in the dry state; but they appear to have been ill adapted to the purpose, for the head of the celebrated Calydonian boar, which Pausanias saw in one of the temples of Greece, had evidently suffered by time, or the ravages of insects, and had lost the greater part of its bristles.

The art of preserving animals appears to have been but little, if at all, practised during the middle ages; for we only now and then meet with a notice of natural objects being kept as curiosities in the treasuries of emperors, kings, and princes. It is only in the records of the period when the study of natural science was resuscitated that passages are to be met with indicative of a knowledge of taxidermy. Sportsmen had undoubtedly practised it much earlier, in a rough manner,† for the purpose of making effigies of call-birds, in the absence of the living

* In one of the *Epistles* of Horace (Epist. lib. I., Epist. 2, l. 65), addressed to Lollius, a passage is met with, which has been generally construed into a knowledge of Taxidermy among the ancients. The words are:—

Venaticus, ex quo
Tempore cervinam pellem latravit in aula,
Militat in silvis catulus.

Many interpret *pellis cervina* as a stuffed stag, placed in the hall, and barked at by the dog. This explanation assumes that the ancients decorated their halls in such manner, like a modern hunting-box. The passage is, however, intelligible if we translate *pellis cervina* as the mere skin of the stag.

† Although the foregoing sketch suffices to show that the art of taxidermy can only have been very gradually developed, still it will not be inappropriate to introduce in this place the often-told, but improbable, anecdote of a rich gentleman of London named Lever, who is said to have possessed a valuable collection of living birds. These all died in one night, owing to the stove used in the aviary having cracked, and the vapours suffocating them. The intensity of Mr. Lever's grief at the loss of his favourites induced him to make an effort at preserving

bird, while they imitated the note of the bird with their own voice, or some artificial contrivance.

The first records of collections of objects of natural history relate to the second half of the sixteenth century, and it appears from them that such museums existed chiefly in Italy; in relation to which the name of Francesco Calceolari deserves especial mention (Verona 1584). These collections, which were commenced by private individuals from purely scientific motives, increased in number and importance in the seventeenth century. This period gave birth to the collection of the Tradescants (father and son), which was purchased in 1659, by Elias Ashmole, who presented it in 1683 to the University of Oxford, and thus founded the Ashmolean Museum; and also to the collection of James Petiver, which was much enriched by Sir Hans Sloane, and, on the death of this distinguished naturalist, became the nucleus of the British Museum. It is from this epoch, in which the majority of continental collections took their origin, that the art of preserving skins must be dated; and from the moment it became subservient to science, it kept pace with the growth and requirements of these institutions.

It is a point of extreme interest to compare the admirable productions in taxidermy contributed to the Great Exhibition, with the old specimens of the art of animal-stuffing to be met with here and there in the museums of natural history. Nothing more dissimilar can be imagined; for while the successful productions of modern times present Nature to our eyes, and show that the artist has closely studied her hidden secrets, the animals of the old stuffers resemble anything but that which they are intended to represent. It would appear that the study of nature was not deemed to be essential, and that imagination took its place, and was allowed great latitude in the putting-up of the stuffed effigies; so much so, that the living prototype would have recoiled in horror from the contemplation of its defunct representative.

The older taxidermists had, evidently, to direct their entire attention to overcoming the difficulties presented by the material, the preservation of which was the main point. At first they contented themselves with removing the intestines and the brain, especially in birds; they attempted to prevent the putrefaction in the remaining parts, by exposing the bodies to a gradually increasing temperature for the purpose of expelling all the water. But however carefully the drying was attended to, it is evident that these productions were of an ephemeral character, as they presented a tempting bait to many descriptions of insects. An improvement was next effected by removing the large fleshy muscles, the entire skeleton still remaining. At present, the skin alone is employed; all parts that rapidly undergo putrefaction being carefully removed. By this means, and by the aid of modern chemistry, which has yielded a series of useful preparations to the taxidermist, the putrefaction of the stuffed animals was prevented. The operator was consequently enabled to direct his attention to other points of great importance; and from the moment he was freed from anxiety respecting the preservation of his subject, he

their dead bodies, and he is said to have succeeded in this by the aid of his physician, who invented animal-stuffing for the occasion. These birds are reported to have given rise to the Leverian Museum, specimens from which may yet be met with in the British Museum.

strove to perfect his mode of representing nature, and thus completely altered the range of his art. The skin of the animal has now become, in the hands of the taxidermist, a crude material to be endowed with form, and life-like attributes, as the marble under the chisel and mallet of the sculptor; and unless, like him, he prepares his mind by anatomical studies, and a close observation of nature, he will surely fail to realise a satisfactory production. The Works of Art exhibited—for to many of the specimens the term may be well applied—prove that animal-stuffing has been cultivated with unequivocal success in this direction.

UNITED STATES OF AMERICA.

The Exhibitors are Two in number, one of whom sends a Black-eyed Squirrel, and the other a case of Animals, Birds, and Fishes; but neither of these contributions calls for especial notice.

BELGIUM.

The contribution which comprises a case of Stuffed-birds indigenous to Belgium, and also a case of Stuffed Foreign Birds, requires no especial notice.

BRITISH COLONIES.

British Guiana.—Mr. A. F. RIDGWAY exhibits a case of stuffed birds, comprising:—the Toucan, Blue Parrot from Essequibo, and the Yellow-bellied Trojan. *Nova Scotia.*—Mr. A. DOWNS contributes some well-prepared specimens of Birds from that colony. *New Zealand* sends specimens of Insects. *South Africa.*—Captain FADDY, R.A., exhibits specimens of the Hartebeest, the Striped Koodoo, and the Waterboc, from the Cape of Good Hope. The manner in which these have been preserved and set up cannot be commended; but it is alleged that the two last-named animals are the first of their kind that have reached this country: and if so, they are of interest. *Van Diemen's Land.*—Mr. F. COX exhibits a case of Tasmanian Insects; and Mr. BONNEY, one of Tasmanian Birds; which are interesting specimens. Mr. W. H. INCE, of Chelsea, exhibits a case of Birds formerly belonging to the late Captain J. M. R. Ince, who died at Hong-Kong whilst commanding Her Majesty's ship "Pilot." They formed part of the rare and interesting specimens of Natural History collected by that officer when Lieutenant of H. M. S. "Fly," during the survey of the Great Barrier Reef and Coasts of Australia. These specimens are of great interest, not only from their number (Forty-two) and the beauty of the examples, but also from the evidence they afford of the cultivation of science by the officers of the British Navy. *Western Africa.*—HER GRACE THE DUCHESS OF SUTHERLAND exhibits a case of Birds from the river Niger.

FRANCE.

It is much to be regretted that no contribution has come from France. The attention and the chemical and scientific research bestowed upon this art by

French naturalists,—Bécœur of Metz, the inventor of the metallic-soap;* Fontenelle, Dufresne, and others, and the value of their writings, is well known to naturalists; and it would have been interesting to compare the present condition of the art in that country, with the progress which has been made elsewhere.

SARDINIA.

The only contribution is an Elk from the Zoological Museum at Turin. This specimen is most remarkable. It exhibits to perfection the art of representing the living animal, not only in its general form and character, but marking also the fine and delicate undulations of the flesh and muscles, and all the anatomical details which are externally traceable. The difficulty of effecting this is so great that generally it is scarcely attempted; but in the present instance the artist has been most successful. The process adopted by Sig. COMBA, the Exhibitor of this specimen, has been that of modelling the animal in clay, and from that model forming a mould; this mould enabled him to construct a figure of a material resembling papier-maché, retaining all the fidelity of the original model; upon this figure the skin is stretched.

UNITED KINGDOM.

The number of British Exhibitors is Thirteen. Of these the following deserve especial notice. A. D. BARTLETT exhibits an ingenious example of the art in the constructed figure of the Dodo—a bird which was once a native of Mauritius, and found there in considerable numbers at the beginning of the last century—but now, as far as is known, entirely extinct. The drawings of Savery, preserved in the Belvedere at Vienna, and in the Royal Gallery at Berlin, and some remains of a skeleton formerly in the collection already alluded to, of Elias Ashmole, consisting now but of the head and one foot—are the data from which the figure has been compiled. The process is of course very different from that of preserving a real animal, the skeleton and skin of which are entire: an artificial body has to be constructed, and then covered, feather by feather, with such plumage as is most in accordance with our knowledge of the bird. This has been very skilfully executed; and the result, by the testimony of Mr. Strickland, and of Mr. Gray of the British Museum, "represents with great accuracy the form, dimensions, and the colour of the Dodo, as far as these characteristics can be ascertained from the

* BÉCŒUR'S ARSENICAL SOAP.

Camphor	-	-	-	-	-	-	-	5 ounces.
Arsenic (<i>arsenious acid</i>), in powder	-	-						2 pounds.
Curd soap	-	-	-	-	-	-	-	2 pounds.
Salts of tartar (<i>carbonate of potash</i>)	-	-						12 ounces.
Lime, in powder	-	-	-	-	-	-	-	4 ounces.

The soap is first cut in small slices, and melted gradually with water over a slow fire, stirring all the time. When melted, the salts of tartar and lime are added and well mixed. The mass is then taken from the fire, and the arsenic triturated with it in a mortar; and, lastly, the camphor is added, after having been separately triturated to powder with the aid of a little spirit of wine. The mixture has the consistence of stiff flour-paste.—The *Art of Taxidermy*, by Peter Boswell, p. 2.



HAWK AND HERON.
(STUFFED)

HANCOCK.

evidences which exist," whilst it "does great credit to Mr. Bartlett's skill, and to his practical acquaintance with the structure of birds."

There are other specimens exhibited by Mr. Bartlett which are, perhaps, more attractive, inasmuch as they represent nature with a fidelity of which all can judge. The pair of Impeyan Pheasants, entitled "*Courtship*," and the Sleeping Orang-outang, "*Repose*," are especially deserving of notice. The fleshy parts of the latter have been very skilfully treated, and the dried and shrivelled appearance which they so often assume is entirely avoided.

The skeleton of the Orang-outang has been preserved, and also the viscera; the whole furnishing an example of the manner in which rare specimens should be dealt with, in order to secure accurate information to the naturalist, and to promote the advancement of science.

J. A. HANCOCK, of Newcastle, exhibits, in the North Transept, some beautiful examples, not only of a faithful and spirited adherence to life and nature, but of a skilful and harmonious combination of forms and colours. The three illustrations of Hawking, and the scene in the Tropics, will go far towards raising the art of Taxidermy to a level with other arts which have hitherto held higher pretensions. The first of the three objects, illustrating the ancient sport of Falconry, is the Hooded Hawk, looking lean and hungry, with the strap attached to his leg, by which he is held on the falconer's fist. In the second group, the Falcon has struck to the ground, and is in combat with, the *Quarry*, a powerful Heron, who is struggling in vain against the attacks of his enemy; whilst the Eel, which but for the interposition of the Hawk would have been soon devoured by the Heron, is quietly making his escape. The third tableau exhibits the gorged Falcon; what a contrast is here presented! the blood-thirsty enemy of the Heron is scarcely to be recognised in the drowsy figure: standing on one foot, the other being drawn up under his breast—the eye half closed: he is the very image of gluttony. The tropical group comprises Cockatoos and Parrots disporting in a rich tropical vegetation, glittering (perhaps too much so) with brilliant Butterflies and Beetles, Lizards, and other Reptiles. The stolid, heavy, self-satisfied expression of the parrots is well brought out by comparison with the anxiety and trepidation of the Mate of the Dead Gull in another group; or with the restless gaze of the Lämmergeyer of the Alps. The contrast between Life and Death is also well kept up, by the display of a group of Dead Game, the ruffled state of the feathers being exceedingly truthful.

C. GORDON exhibits a representation of an Owl "mobbed by small birds," in which the action of the owl and of his tormentors is given with great liveliness and fidelity.

Dr. BEEVOR, of Newark, exhibits a Dog prepared much in the same way as the Elk contributed from Sardinia, and although not included in the Awards hereafter to be enumerated, it is deserving of favourable notice.

J. LEADBEATER exhibits a curious and instructive collection of Indian Gallinaceous birds; and an extensive collection of Humming-birds, comprising about 300 or 400 varieties, in the North Transept, which are very carefully set up.

T. M. WILLIAMS and J. GARDNER exhibit a brilliant assemblage of richly plumaged Birds from various parts of the world. The productions of these artists are apparently of a class rather for the drawing-room than the cabinet of the

naturalist. They have selected chiefly those denizens of the air most distinguished for the brilliant colouring of their plumage. So far as the careful preservation of the plumage is concerned, they deserve commendation, but in respect to a delineation of the habits of the birds by appropriate scenery, they fall short of the excellencies attainable in this art.

WURTEMBERG.

The collection of H. PLOUCQUET consists of, 1st. A series of scenes taken from Kaulbach's illustrations of the well-known German story of Reynard the Fox (*Reineke Fuchs*), and executed with great skill. In these the Exhibitor does not of course claim the merit of conception; but the humour with which the design of the artist is carried out, and the expression thrown not only into the attitude, but into the countenance of each animal, is admirable.

2nd. Groups of Birds and small animals in action, designed as well as executed by the Exhibitor. Some of these also are humorous, and show considerable ingenuity, as, for instance:—a Love-scene illustrated by Weasels; a Parting-scene between a Cat and a Polecat; a Literary Polecat, &c. Others represent the movements or habits of birds in the care of their nests or of their young; the appearance of the broods at different ages; and the action of the parent birds in defending them against attacks of other animals. All are remarkable for spirited and life-like execution.

3rd. The representation of two large Hunting scenes, such as form the subjects of Snyder's pictures. One, an attack of Dogs upon a Wild Boar; the other, a Stag pulled down by Hounds. These evince great spirit, and a close study of nature; although in one or two instances the action of the limbs and muscles are not minutely correct. These inaccuracies, however, are so few and so slight, that they cannot detract from the very great merit which belongs to the whole of M. Ploucquet's exhibition. The process employed by M. Ploucquet in preparing some of his smaller specimens has been to mould the figure of the animal in plaster-of-Paris, and to stretch the skin upon the model; and it has been most successful. The groups of M. Ploucquet attract by far the largest share of public attention.

There are Twenty-six Exhibitors of Taxidermy, of these there are:—

4	Holders of a Prize Medal.
1	Who obtained Honourable Mention.
21	Unrewarded.
—	
26	Total.
—	

The classification according to the various countries is as follows:—

America, United States of	2	Van Diemen's Land	-	-	-	3
Belgium - - - - -	1	West Africa - - - - -	-	-	-	1
British Colonies:—		Sardinia - - - - -	-	-	-	1
British Guiana - - - - -	1	United Kingdom - - - - -	-	-	-	13
Nova Scotia - - - - -	1	Wurtemberg - - - - -	-	-	-	1
New Zealand - - - - -	1					—
South Africa - - - - -	1	Total - - - - -	-	-	-	26
—	7					—

LIST OF AWARDS.

BARTLETT, A. D., Great College Street, Camden Town (Class XXIX., No. 291). Prize Medal, for a model of the Dodo, and several excellent examples in the higher branches of Taxidermy.

COMBA, F., Turin (Sardinia, No. 83). Prize Medal, for a Stuffed Elk, exquisitely modelled.

GORDON, C., Museum, Dover (Class XXIX., No. 202). Honourable Mention, for a group of Stuffed British Birds.

HANCOCK, J., Newcastle (Class XXIX., No. 320). Prize Medal, for several single specimens and groups of Stuffed Birds and Animals, most truthful as to the representation of the habits and appearance of these creatures; and in every respect of the highest merit.

PLoucQUET, H., Stuttgart (Wurtemberg, No. 107). Prize Medal, for several humorous groups of Stuffed Animals; Groups illustrative of the habits of birds, and two large Hunting-pieces.

C.—ARTICLES CONNECTED WITH EDUCATION.

I.—EDUCATIONAL MODELS.

There is perhaps no subject more deserving of the attention of enlightened persons, nor any means more conducive to the intellectual and physical advancement of a people, than the dissemination of *accurate* practical knowledge among all its classes; and it is one of the most gratifying circumstances of the present age to find many philanthropic individuals endeavouring to smooth the path to knowledge, for those whose position in society does not permit of their engaging in a long course of study.

Beyond the mere rudiments of education, no branch of learning is more valuable to the working-classes than applied Physics and Mechanics; and in those departments there are no means better calculated to impress the mind of the student with the great unchangeable laws of nature, and with the construction of the mechanical contrivances by which man renders them available for his wants, than Working-Models. Under ordinary circumstances, however, these useful aids are unobtainable by the majority of students, on account of their expense. In order to remove as far as possible this impediment, EDWARD COWPER, Professor of Manufacturing-Art and Machinery at King's College, London, has contrived a series of *cheap* models to illustrate his courses of lectures, with the view of stimulating his students to imitate them, in consequence of their extreme simplicity. Finding that they fully answered their intended purpose, he has since allowed them to be copied by the Society for the Promotion of Christian Knowledge, for the purpose of their introduction into National-schools. The Society is thus enabled to supply them at a few pence only above their prime cost; and at the same time it also furnishes pamphlets explanatory of the various parts of each model and their functions, so that the teacher may readily acquire and easily impart a knowledge of the subject they are intended to illustrate. For example, a Sectional-Model of "the Working-parts of a Steam-engine," 20 inches by 10 inches, is furnished for 7s. 6d. All the parts are moveable, and the name of

each is indicated by a printed label pasted on it; as cylinder, piston, piston-rod, connecting-rod, crank, fly-wheel, valve-box, slide-valve, steam going *into* the cylinder, steam going *out of* the cylinder, &c. It would be impossible to estimate how many of the millions of visitors to the Great Exhibition there are who would be thankful for the information obtainable in the North-East Gallery from this and similar *rough* but valuable models.

Besides the model of a steam-engine, the following are also exhibited:—an Orrery, or Stellarium, price 10s., showing the revolutions of the earth round the sun, and of the moon round the earth; also the rotation of the earth on its axis, the inclination of the axis to the orbit, illustrating the cause of the seasons; and the inclination of the orbit of the moon to that of the earth. A Working-section of a Pump, 24 inches by 10 inches, price 7s. 6d.; a six-inch Sphere for showing the phases of the moon, 2s.; a box of Cubes, Bricks, &c., for teaching Tangible Arithmetic, 8s. 6d.; a series of Measuring-rods, of 1 foot, 2 feet, and 6 feet in length, at 2d., 4d., and 6d. each; specimens of Levers, also a Scale-beam and Steel-yard, 3d. each; a Loom for weaving tapes, garters, &c., 7s. 6d.; a Door-lock, 20 inches square, 7s. 6d. The only Exhibitor of Educational Models which have come under the consideration of this Jury is

Prof. EDWARD COWPER, Kensington Park Villas (Class XXIX., No. 245), to whom a Prize Medal is awarded.

II.—ETHNOGRAPHICAL MODELS.

Under this title will be described a few collections of small Figures, illustrative of foreign costumes and manners, which have come under the notice of the Jury of Class XXIX., although they were arranged as belonging to Class XXX. These, apart from their excellence as works of art, possess a very high interest, as conveying, through the eye, a vivid representation of the customs, occupations, and habits of the natives of distant countries, not so easily apprehended from any written description, however well illustrated by drawings. These models are confined to the Court of the Fine-Arts, with the Maltese, the Indian, and the Spanish Courts. Those contained in the first-named department attract by far the largest share of public attention; although, in respect of the particular excellence which is here contemplated, they possess, perhaps, less interest than the very diversified and most extensive series in the Indian Court. It is to be feared that this latter collection will be dispersed, with the other splendid contents of the Department, before its value can be fully appreciated.

UNITED KINGDOM.

The Fine-Art Court contains a collection of very beautiful, life-like, and spirited Figures, modelled in wax with most surprising minuteness and artistic feeling, both in the position and grouping. They represent the natives of Mexico, and also the American Indians, habited in their proper costume, and displaying their characteristic customs in the several phases of civilized and savage life, with a truthfulness in the varied expressions and anatomical development of the different effigies, which is most remarkable. An Indian rejoicing in triumph over the despair of a white victim, whom he has bound and is about to scalp, but whose sufferings he is prolonging with savage cruelty, may be especially cited in illustra-

tion of this particular excellence; and the group of three figures, entitled "a Confessional," as an instance displaying a rich vein of humour. The "*Aquador*," or water-carrier; the "*Remendor*," or street-cobbler, in his tattered garments; the group of civilized Indians laden with produce; the group of savage Indians, called "*Mecos*;" the *Fandango*, a national dance, illustrated by two Indian women dancing to the guitar, played by a male figure, with numerous other examples which might be adduced, are also all deserving of equal praise.

INDIA.

The Figures in the Indian Courts, which have, it appears, been contributed by several Exhibitors, are either modelled in clay or plaster, or else carved in wood, and painted to represent the natural colours of the various objects. The largest group, which was contributed by Mr. MANSFIELD, of the East India Company's civil service, is contained in a model of the "*Jamma Bundi*," or the encampment of a Government collector, whilst moving about on his annual tour through his district. The figures are of plaster, and the buildings of wood. The double-poled tent of the Collector is pitched at a short distance from the village; and he is represented as sitting within it, surrounded by the "*Manletdar*," and other revenue officers. Several petitioners are congregated around the door of the tent, soliciting a remission of part of the payments due from them. The figures of men and animals are about Three hundred in number, and present a lively representation of Indian life and character. Some are indolently lying under the trees, some are gazing at the performance of a snake-charmer, and some feeding an elephant; whilst others, more intent on the business of the day, are having their petitions written out by the village accountants, or "*Coolkurnees*." The village, near which the encampment is formed, is represented inside a fortified wall, which surrounds it, and which is shown in section. There are also to be seen the numerous shops and rows of houses in the village, with the inhabitants engaged in their various pursuits.

The best executed and most instructive models, however, are those of clay, manufactured in Kishnaghur, representing the various castes and professions of the Hindoos, which collection comprises upwards of Sixty illustrations, some consisting of several figures. Here, almost in the closest juxtaposition with the splendid cotton carding, spinning, and weaving machinery exhibited in Class VI., there is to be seen a Bengal woman cleaning cotton with the strung bow, and another spinning with the most primitive of apparatus; and the Weaver preparing his thread on his roughly-made loom. Not far from Nasmyth's steam-hammer, the "*Khamar*," or Bengal blacksmith, is represented with his simple bellows, forge, and anvil; and within a very short distance from the latest refinements in agricultural implements and machinery, are illustrations of Ploughing and Harrowing with apparatus which no European could use; and Rice-grinding that must require all the patience of an Indian to perform. On a line with the locomotive-engines which convey our correspondence with a celerity not dreamed of a few years since, and even now insignificant in comparison with the lightning speed of the electric telegraph, are effigies of the *Dawk-runner*, or Bearer of the Government Mail-bags; and the *Dawk-bandy-buridar*, or Messenger who carries Post-office Parcels; and, closely watched by the unarmed policemen, are the

Bro-jobassee, or armed watchman, and the *Chowkeedar*, or village watchman. These are only a few of the groups of this most suggestive and well-executed collection. It will recompense the most attentive study; and the visitor cannot fail to be astonished at the very simple implements used by the Hindoos to effect operations for which costly and ponderous machinery are generally employed with us. An instance, in addition to those already cited, may be pointed out in the primitive pair of wooden cylinders for crushing the sugar-cane, which are turned by a single individual with a cross-handle, whilst two others are engaged, the one in feeding the machine, and the other in taking away the juice and the crushed cane. This simple machine, although not comparable with the gigantic three-roller crushing-mill with its attached steam-engine, seen in Class VI., nevertheless shows that the Indians were acquainted with the principles involved in its construction.

Less perfect in point of execution than the Kishnaghur clay figures, but still most interesting, are the Models manufactured at Gokak; which it appears are not made as articles of export, but only to order. This collection comprises about forty illustrations, out of which may be especially noticed, as representing trades, the Cotton-printer, the Potter, the Woman grinding meal, the Bengal Water-carrier, or *Bheestee*, and the Washerwoman, or *Dhobie*.

The Models illustrating the practices of the Thug murderers excite the most painful interest, and represent the following incidents:—A traveller, induced to sit down and smoke, has his attention directed to the heavens, when the fatal handkerchief is applied by a Thug who stands behind him; but in another group a horseman is successfully defending himself from an attack on the part of the Thugs, one of whom he has slain. The mutilation of the bodies of the murdered, and their concealment in a well, and the strangling of travellers on horseback and on foot, are also represented. It is stated that some of these Thug murderers, after having been arrested and reclaimed, and domiciled in a school of industry, were the manufacturers of the carpets exhibited in the Indian tent.

The other Models contained in the Indian Court comprise Thirty-five Figures in wood, from the Rajah of Jodhpore; a model of a European court of justice, and also one of a Native court; models of a Silk-factory and an Indigo-factory, of a native Oil-mill, and of a Farm-establishment. A series of male and female figures, exhibited by T. E. J. BOILEAU, represent the principal Sects in Cochin China and Travancore.

MALTA.

The Figures from Malta, which are modelled in wax, have not the same claims to merit as those before described, but have still a certain amount of excellence. They represent the Grand-Master Valetta, the Grand-Master Lonzadari, with the Master of the Order of Malta, and a Knight, in their proper costume.

SPAIN.

Three Exhibitors contribute models illustrative of the manners and dresses of Spain. Two of these send figures in painted terra-cotta, representing the inhabitants of Andalusia and Malaga; but the examples are not numerous, though they are remarkable for the beauty and correctness of the modelling. The other

Class A.—*Organic Substances.*

Section I.—Animal products.

1. *Mammalia*.
2. *Aves* (Birds).
3. *Reptilia* (Reptiles).
4. *Pisces* (Fishes).
5. *Mollusca*.
6. *Insecta* (Insects).
7. *Radiata*.
8. Articles produced by Insects.

Section II.—Vegetable Substances.

1. Oils and Balsams.
2. Fruits, Nuts, &c.
3. *Materia Medica* (Medicinal Products).
4. Vegetable Juices and Vegetable Extracts.

5. Dyeing Materials.
6. Tanning Materials.
7. Spices.
8. Oil Seeds.
9. Agricultural Seeds.
10. Dietetic Articles.
11. Vegetable Fibres.
12. Timber and Hard Woods.
13. Miscellaneous (Hops and Rushes).
14. Tobacco.
15. Feculas.

Class B.—*Inorganic Substances.*

Section I.—Metallic.

Section II.—Non-Metallic.

To each article are appended the Commercial and Scientific names, and the name of the Class or Order to which they belong, with the quantity imported into Liverpool; the locality whence they were exported, and the use of each substance in the Arts are also indicated.

A glance at the numerous divisions and subdivisions just cited will immediately suggest how valuable and interesting such collections would be to the principal seats of British manufacturing-industry, especially if they were made so comprehensive as to comprise all raw materials; and not only such as are usually imported, but those also which are known to be useful in the arts, or are likely to prove so, from the quantities in which they can be obtained. These Museums of Raw-Produce would, however, be rendered even still more useful by the appointment of energetic curators, fully qualified by previous studies to impart accurate, scientific, and commercial information concerning their contents.

It appears from the statement of Mr. Thomas C. Archer, by whom the Liverpool collection was arranged, that the cost of it was about 400*l.*, which must be regarded as a very small expense, in comparison with the importance of the results to be derived from it. Ten months were occupied in making the collection; but it appears that the greater part of each day was consumed in obtaining the necessary funds, in soliciting samples from the produce-brokers, and in overcoming the hostile prejudices which existed concerning it. The evenings only were devoted to the classifying and naming the specimens, which were obtained by gift or purchase. The time consumed was, it was stated, one of the principal items of cost, as the Liverpool Local Committee had to reimburse to Mr. Archer his salary from the Government, which he ceased to receive during the ten months he was engaged in making the Collection. About 200*l.* were thus expended; but a large portion of this outlay is attributed to loss of time in soliciting subscriptions; for had sufficient funds been placed at the disposal of the Liverpool Local Committee in the first instance, Mr. Archer conceives that a collection ten times as extensive might have been formed, at a cost but little above that of the present one. This indeed was collected under great disadvantages, a few cases being provided as they were required or could be afforded. Much credit is due to the Liverpool Local Committee, and especially to Mr. Archer, for the perseverance which they evinced in prosecuting their labours under such difficulties;

as well as for having produced, notwithstanding, so extensive and valuable an exhibition for so small an expense. As a detailed list of the specimens comprised in this display is given in the *Illustrated Catalogue*, pages 803-817, it is unnecessary to reprint it in this Report.

The Collection of Imports into the Port of Hull, exhibited by the Hull Local Committee, is of the same description as that of Liverpool, but far less extensive. This was to be anticipated from the relative commercial importance of the two towns, and from the nature of the trade at Hull, which is chiefly with the Baltic. Hence Flax, Iron, Tallow, Cereal-grains, Linseed, and Linseed-cake, form important items in it. Altogether there are about One hundred and twenty different substances exhibited, to which are appended the commercial and scientific names, and the quantity of each imported into Hull. A detailed list of the collection is given at page 817 of the *Illustrated Catalogue*.

INDIA.

The next of the series under review is the Miscellaneous Collection of Mineral, Vegetable, and Animal Substances, used by the natives of India, in their various Arts and Manufactures, as well as in Medicine. They were principally gathered from the Bazaars of the Bengal Presidency, by Dr. J. FORBES ROYLE, during his residence in India; but they include also some additions obtained by Dr FALCONER, in Cashmere, and by Dr. STOCKS, in Scinde.

In the arrangement of this collection for the Great Exhibition, Dr. Royle states that he is much indebted to Mrs. ROYLE for her assistance. It is important, from the vast number of substances contained in it, which amount to between Eleven and Twelve hundred in number, procured from a few only of the Bazaars of India. They are used by the natives for a variety of purposes; but though many of those which are said to be useful as Medicines may not possess active properties, others are known with certainty to be some of the most powerful and efficient drugs; and it may also be inferred that there must be many others possessed of useful properties, though they are but little known in Europe. But independently of their medicinal uses, there are among the various substances many which are useful as food, or in the Arts; as, for instance, the different Cereal Grains and Pulses; Starch-yielding Seeds and Roots, Oil-seeds, Gums and Resins, Dyes, &c., as well as Animal and Mineral bodies. These substances show, at a glance, the resources which the natives of India possess, and have long possessed, for practising many of the Arts in which they attained, at a very early period, a very high degree of perfection, with apparently very imperfect means.

The Collection is farther interesting, both in a literary and scientific point of view, because most of the substances, which are here gathered into a focus, have their properties described in the various works on the *Materia Medica* which are at present in use in India. In those works a variety of synonymes are given, with the names of the same substances as known in the Hindoo, Persian, and Arabic languages, and very frequently in the Greek also. The universal knowledge of these productions is accounted for by the circumstance that the medical works which are in use by the Mahomedan Hakims in India are translations from the Arabic into Persian, with which has been incorporated information from the

writings of the Hindoos. The Arabs, at the Court of Haroun-al-Rashid, it is well known, made translations from the Greek authors, such as Dioscorides; and hence it will be understood why many of the substances, mentioned in such Persian translations as are now in use in India, have both the Arabic and Greek synonymes assigned to them. By means of this Collection we are enabled to examine numerous specimens of Asiatic natural productions, which are all labelled with their synonymes; and hence it is frequently possible to ascertain the very substances which both the Arabs and the Greeks have described, and to which they assigned an Eastern origin. Thus the *Nardus* (Spikenard) of the Greeks may be shown to be the *Jatamansi* of the Hindoos; and Dr. Falconer has identified their *Costus* with the *Koot* or *Koost* of the Arabs, a product of the mountains of Cashmere, which in former times found its way to Europe, and at present forms an extensive article of commerce with China. Many of these interesting parallels have been traced out by Dr. Royle, in his *Essay on the Antiquity of Hindoo Medicine*, as well as in his *Illustrations of Himalayan Botany*. He has also been able to identify some of the plants mentioned in the sacred writings, from their Arabic synonymes, as he has shown in his paper, *The Mustard-tree and the Hyssop of Scripture*.

As a complete list of the articles contained in this invaluable Collection is given in the *Illustrated Catalogue*, pages 893-907, it is only necessary here to state that it comprises Nine hundred and nine substances of vegetable origin, Thirty-two animal products, and Two hundred and two bodies derived from the mineral kingdom. To every specimen its scientific name and synonymes are appended, and also the locality whence it was obtained. The vegetable substances comprise 193 Roots, 10 Woods, 202 Barks, 445 Fruits and Seeds, 12 Galls, and 47 Gums, Resins, and Gum-resins. If a collection of all those products which are but little known were rendered available, under certain restrictions, to the investigations of the scientific chemist, it would undoubtedly do much to advance our knowledge in organic chemistry, and could not fail to be productive of material benefits, not only to the science of medicine, but also to the arts.

UNITED STATES OF AMERICA.

The *Collection of some of the Products and Manufactures of the State of Maryland*, which is contained in an ornamental cabinet made of the principal woods of that State, comprises about Eighty different substances. The chief of them are Ores, Chemicals, and Woods; and the cabinet itself illustrates the uses to which the woods may be applied. The Jury of Class IV. having also awarded a Medal to this interesting collection, it is to be expected that the various objects exhibited will be discussed in detail in their Report; but as the *Illustrated Catalogue* does not contain a list of them, the following summary will not be regarded as misplaced:—

MINERALS.

Anthracite Coal—2 kinds.
Bituminous Coal.
Building-sand.
Copper ore—3 varieties.
Free stone.

Gold-ore.
Granite—2 varieties.
Iron-ore—8 kinds.
Lead-ore.
Marble—3 varieties.
Soap-stone—*Steatite*.

METALS.		Cedar.
Copper rods.		Cherry.
Copper sheets—3 kinds.		Hickory.
Pig-iron.		Holly.
Wrought-iron.		Lime.
Yellow-metal.		Locust.
METALLIC MANUFACTURES.		Maple—2 kinds.
Iron Nails.		Mulberry.
Shots.		Oak.
Stereotype-plates.		Pine.
Types.		Poplar.
CHEMICAL MANUFACTURES.		Walnut.
Alum (<i>Double Sulphate of Alumina and Potash</i>).		2. <i>Cereal Seeds and Meal.</i>
Bichromate of potash.		Barley.
Blue vitriol (<i>Sulphate of Copper</i>).		Buckwheat.
Chloride of lime (<i>Hypochlorite of Lime</i>).		Buckwheat-meal.
Chrome-yellow (<i>Chromate of Lead</i>).		Indian-corn, yellow and white.
Chrome-green (<i>Chrome-yellow and Prussian-blue</i>).		Indian-corn-Meal.
Copperas (<i>Proto-sulphate of Iron</i>).		Oats.
Epsom salts (<i>Sulphate of Magnesia</i>).		Rye.
Glue (<i>Gelatin</i>).		Wheat, white and red.
Magnesia.		Wheat-flour.
Magnesia, Carbonate of.		3. <i>Tobacco.</i>
Prussian blue (<i>Sesqui-ferrocyanide of Iron</i>).		Chewing Tobacco.
Red-lead (<i>Red oxide of Lead</i>).		Leaf Tobacco.
Saltpetre (<i>Nitrate of Potash</i>).		4. <i>Vegetable Manufactures.</i>
Soap.		Cotton Goods.
Stearic acid.		Flax Thread.
White zinc (<i>Oxide of Zinc</i>).		Paper.
BUILDING MATERIALS.		5. <i>Animal Products.</i>
Bricks, 3 kinds.		Belt-Leather.
Fire-bricks.		Calf Leather.
Lutch-bricks.		Cloth, of mixed cotton and wool.
Fire-bricks.		Felt.
VEGETABLE SUBSTANCES.		Morocco Leather.
1. <i>Woods.</i>		Silk.
Ash.		Woollen Cloth.
Beech.		

The number of Exhibitors in this Section is Four, to all of whom Prize Medals have been awarded.

The following is the classification of the contributors according to their respective countries :—

America	-	-	-	-	1
British Colonies (India)	-				1
United Kingdom	-	-			2
					4

LIST OF AWARDS.

ARCHER, THOMAS C. (Liverpool, Class XXIX., No. 270). Prize Medal, for the Collection of the samples of Foreign Articles imported into Liverpool within the last five years, of which he was the Collector and Arranger.

HULL LOCAL COMMITTEE (Class XXIX., No. 290). Prize Medal for the Collection of Staple Imported Articles of the port of Hull.

MARYLAND, COMMITTEE OF (United States, No. 371). Prize Medal (*the same Award being given by the Jury of Class IV.*), for a Cabinet containing specimens of some of the products and manufactures of the State of Maryland.

ROYLE, Dr. J. FORBES, India. Prize Medal, for a Collection of Mineral, Vegetable, and Animal Substances, useful in Medicine and the Arts.

To which may be added, the Award of a Prize Medal to the SULTAN OF TURKEY, for numerous examples of Soaps, Candles, Confectionary, and Pipes, which have been noticed in the respective articles on those subjects also included in the present Report.

D.—MANUFACTURES FOR PERSONAL USE.

I.—DRESSING-CASES, WRITING-DESKS, WORK-BOXES, &c.

Although Writing-desks are comprised in the list of articles allotted to Class XXIX., yet, as they are also included in that of Class XVII., to which they appear more properly to belong, they are displayed in both. The latter class, however, contains the greater number of examples; and, likewise, the most important of those which are covered with Russia and other leathers, and either “chequered” or ornamented after the manner of the bookbinder. Work-boxes are not nearly so numerous, and are chiefly from Belgium. Dressing-cases, consequently, form the chief portion of the contributions in the branch of art now under consideration; and they are exhibited almost exclusively by British and French manufacturers who appear to monopolise the supply of these articles. On account, therefore, of the prominent position of Dressing-cases in Class XXIX., they will be chiefly treated of in the subsequent remarks; Writing-desks and Work-boxes being, however, noticed, wherever they call for especial observation. The latter may, indeed, be regarded, in some instances, as modifications of dressing-cases, in which some of the contents are allowed to predominate over others; for those cabinets very frequently contain writing materials or apparatus for ladies’ work: and, on the other hand, the fittings of writing-desks or work-boxes sometimes comprise a toilette-set more or less complete. Of both of these kinds several examples are shown in the Exhibition.

DRESSING-CASES.—The tasteful and compact arrangement of these most useful receptacles belongs to a very modern period; but they have, probably, not even yet attained the high degree of elegant convenience of which they are capable. In their primitive character, however, which is simply that of containing some of the materials of personal adornment, even the dressing-case is of considerable antiquity. There is a remarkable allusion to coffers of ivory, probably wrought into the forms of buildings, and containing perfumes, in Psalm xlv. 8, where the passage describes the dressing of a queen by her maids of honour, when preparing to receive her royal spouse.

At a later period, in the days of Roman luxury, the toilette-box of a Roman lady seems, at least sometimes, to have exhibited a methodical arrangement of its contents, and to have been elaborately decorated with the best art of the period.

"In the spring of 1794," says Carl August Böttiger, "some labourers digging for a well in the garden belonging to the convent of the nuns of St. Paul, not far from the Suburra, at the foot of the Esquiline-hill, came upon a large subterranean chamber filled with crumbled ruins; from which, after some time, they succeeded in extricating a chest filled with an ancient Roman toilette-apparatus." The casket was of silver, as well as all the articles found with it, and the same authority continues to state that the dressing-box itself was 2 feet in length, $1\frac{1}{2}$ foot in breadth, and 1 foot in height. It was quadrangular, and consisted of two truncated pyramids joined at their bases, one of which constituted the box and the other the cover. The exterior ornament of this cabinet represented a variety of most interesting sculptures relating to the adorning and bringing-home of a bride; and the inscription "*Secunde et Projecta Vivatis*" seems to confirm the supposition that the cabinet was a female dressing-case and a wedding gift.*

With this ancient casket was also discovered another receptacle, of the species which the Romans denominated *Capsula*; and which, by the chains attached to it, appeared to be intended for suspension from the arm. This vessel formed a box of sixteen sides on the exterior, having a circular cover; and greatly resembled a *Scrinium* for containing manuscript rolls, especially as it was decorated on the outside with raised figures of eight of the Muses, interchained with garlands; the remaining Muse being placed on the summit. The capsula measured one foot in height, and was about 15 inches broad at the base. Within the case was a flat top or tablet of copper, dividing it into one large central compartment, surrounded by four of a smaller size, probably originally intended to receive volumes of books. The contents, however, were boxes, essence-vials, small pateræ and ewers, several toilette-spoons, a taper-stand in the form of a closed hand, a beautiful little vase, covered with arabesque figures, and some ornaments for a litter; all which furniture was of silver. The size, the extent, and the luxury of these antique dressing-cases will, however, be considered less remarkable, when it is remembered that the perfumes, the ornaments, the mirrors, and all the toilette-furniture of a female, was called by the Roman jurisconsults "*Mundus Muliebris*," or a woman's world; and, indeed, they have their parallels in the Great Exhibition.

Cases for combs and mirrors, which were usually kept together, were common in England from the latter half of the sixteenth century; when the haberdashers and milliners, who dealt in foreign small-wares, had increased to an extent unknown before in all the streets of the metropolis, and in the Upper-Pawn or gallery of the Royal Exchange. Some of the cabinets of this period also contained bottles of sweet waters, and pomanders, or perforated silver balls for perfume, for neutralizing disagreeable odours or infection. Such a toilette-case was presented in 1562 to Queen Elizabeth, as a New Year's gift, from Sir John Alee; it being described as a coffer of wood, carved, painted, and gilt, with combs glasses, and balls.

In general, however, down to perhaps the middle of the eighteenth century, the most costly toilette-furniture seems to have consisted of a great variety of articles which covered the dressing-table. It is possible that the thought of fitting up a

* Böttiger's *Sabina oder Morgenscenen in dem Putzzimmer einer reichen Römerin*, p. 62, Leipzig, 1803; translated in the *New Monthly Magazine*, 1818, vol. x., p. 419.

single receptacle with various useful contents, was suggested by the boxes brought from Japan towards the close of the seventeenth century. These were made to contain a number of smaller boxes for powder, patches, &c., of different shapes, and contrived neatly to fit each other. In the "Fop Dictionary," contained in the very curious tract on female costume, published by Evelyn in 1690, entitled "*A voyage to Marry-land, or the Lady's Dressing-room unlocked*," a casket of silver filigree is mentioned, and explained to signify a "dressing-box;" but, from the description, it really appears to have been a case for perfumed waters. All the rest of the appointments consist of a profusion of scattered luxuries, like those which are also described in the commencement of Pope's "Rape of the Lock."

A lady's dressing-case of the present day would appear to have been originally contrived with the view of containing almost as many articles of convenience or luxury as were enumerated by Evelyn as belonging to a lady towards the end of the seventeenth century; and however appropriate such may have been to that period, it is certainly ill adapted for travelling in the nineteenth century; excepting, perhaps, for long voyages in half-civilised countries, or unfrequented tracts where the ordinary necessities of the toilette are not procurable. In travelling, however, through the polished cities of Europe, it is not more needless to be encumbered with a store of gold, when circular notes are obtainable, than it is to carry large quantities of perfumery or any other similar article which can be readily purchased. And if the many vessels usually introduced into a lady's dressing-case were reduced in number and size, it might become nearly as portable as that of a gentleman. Yet, although this is obvious, it is remarkable that not a single example of a lady's dressing-case is to be found in the Exhibition suitable for convenient package or for rapid travelling, when superfluous baggage is very undesirable. At the same time there are numerous instances of gentlemen's dressing-cases, extremely portable, mostly made of leather, which has been found better adapted for the purpose than wood.

The ordinary description of dressing-cases, writing-desks, and work-boxes, admit of classification into two very distinct branches of manufacture, allied, however, by the contents of the cases, some of which are the same in both kinds. The first class is that in which the case is composed of hard-woods, and its ornamentation due entirely to the arts of the cabinet-maker and buhl-worker. The second class comprises all those examples in which the body of the box is made of soft-woods, or moulded in pasteboard, and afterwards covered with leather of various kinds. The exterior is then ornamented, either in a simple style, with creasing-tools guided by means of a wooden straight edge, or more elaborately with tools similar to those of the bookbinder. Beside wood and leather, it should be stated that papier-maché has been introduced into this manufacture, as indeed into many others; and frequently with more regard to a glittering appearance than to beauty of design, of which, however, this material is perfectly susceptible. The natives of India, China, and Japan have employed their various arts in the manufacture of dressing-cases, desks, and work-boxes, suitable for the use of Europeans, and have adorned these respective productions according to their own peculiar styles of ornament.

The articles on which the Jurors of Class XXIX. were principally required to decide, are those belonging to the first two of the preceding varieties: yet, on

consulting the Award-books, it would appear that other Juries have also investigated the merits of some of those productions. It is, however, satisfactory to find that they have, by their decisions, confirmed the awards of the Jury to which they properly belong. Those Awards have been, in most instances, omitted in the list for Class XXIX., as no exhibitor is entitled to more than one recompense for the same description of goods: they are, however, for obvious reasons, mentioned in this Report.

AUSTRIA.

The chief contributions in the Austrian Department are a Dressing-case, and a Dressing-table, covered with velvet, and ornamented with pierced ivory, in which both the material and the ornament are evidently ill-adapted for the intended purpose. Beside these, there are some Ladies' Work-boxes of wood, and Dressing-cases and Work-boxes of papier-maché, both of which varieties are of an inferior description, and not remarkable for cheapness.

BELGIUM.

Five Exhibitors, from that once fashionable watering-place the town of Spa, contribute numerous articles of the so-called Spa-ware, consisting of Work-boxes, Netting-boxes, Reading-desks, Portfolios, Glove-boxes, and other similar articles: these are made of sycamore or maple wood, which has been coloured by immersion in the natural ferruginous waters of the place. The iron compounds (probably chiefly tannate of iron), which are formed by the combination of the peroxide of iron with the vegetable juices, not only develop the minute structure of the grain, but also give an agreeable slate-tint to the wood, which then forms a pleasing background to the elaborate paintings with which the manufactures are embellished. After having been decorated, they are preserved from injury by several coats of varnish, which still farther increases the beauty of the wood by bringing out the grain.

BRITISH COLONIES.

The contributions from the British Colonies are numerous, but they must, in most cases, be regarded rather as curiosities than as articles of large sale. From *Ceylon* there is only one article, namely, a Desk of Porcupine-quills, arranged parallel to one another, and surrounded with a border of carved ivory, the sunken portions being filled with colour. The *Indian* Court contains numerous specimens of boxes made of a variety of materials, and ornamented with great taste in several different patterns. Amongst these may be enumerated a Desk and Envelope-box of ivory and sandal-wood, and a Porcupine-quill Box from Calcutta; a beautifully and elaborately carved Cutch-box, and several specimens of boxes from Bombay, ornamented with tasteful and minute inlaying. *New South Wales* contributes a Desk of polished woods of different kinds. From *New Zealand* there is a box which may be regarded as a native dressing-case, as it is used by the aborigines to contain their head-dresses. In the *South African* Section is exhibited an olive-wood work-box, which has been sent from the GROENKLOOF MISSIONARY STATION. And lastly, from *Van Diemen's Land*, Mr. McNAUGHTEN

contributes a Writing-desk and a Work-box, made of musk-wood, and inlaid with pine, black-wood, she-oak, and myrtle.

CHINA.

There are Three Exhibitors of Writing-desks and Work-boxes in the Chinese Department. Mr. COPELAND sends a Writing-desk used by the Chinese, which contains pencils and other materials for writing, and also a *Swan-pan* or calculating board; and a Japanese writing-desk, inlaid with mother-of-pearl. Two examples of Japan desks are also exhibited by HEWETT and Co., one of which is ornamented with a bouquet of flowers formed of mother-of-pearl, and the other with a landscape painted in relief with gold bronze. These specimens are interesting as belonging to a class of goods now much imitated by the papier-maché manufacturer, but must not be regarded as of the highest class of Japan-ware. The now most celebrated manufacturer of these goods, says our colleague, M. Natalis Rondot, is Hip-qua of Canton, who has made for himself a beautiful, though small, collection of lac-ware caskets. M. de Siebold, of Leyden, also possesses many of the most beautiful examples extant; and the Museum of the Hague also contains many rich specimens. A Camphor-wood work-box, with carved ivory fittings, is sent by HANCOCK and Co.

EGYPT.

The Egyptian Court contains a writing-case made of Alizier-wood.

FRANCE.

Although the Exhibitors in the French department are few, their display, chiefly of Dressing-cases, is most gorgeous and costly, and the articles contributed are remarkable alike for their beauty, brilliancy, and variety. The cabinet-maker of Paris stands unrivalled for the elegant lightness of his designs, and the exquisite finish of his workmanship; and the same is true of the French artist in buhl and marqueterie. Hence it will be readily credited that the plain French caskets are unsurpassed, and the more ornate unequalled. With regard to the fittings—whilst due praise must be given for the taste displayed in the designs, the spirited enchasing, the execution of the enamel, and the due balance of bright and frosted work, yet at the same time it must be stated that the French silver has not the high degree of finish usual in the fittings of an English dressing-case. This defect is in a great measure to be ascribed to the metal being polished without the workman having recourse to those numerous preparatory manipulations which give evenness to the surface. Hence the undulations of surface betray how much has been done by the burnisher and how little by the polisher. The cutlery and glass are also inferior. It must, however, be stated that these dressing-cases are relatively far cheaper than those of the English; and although each silver article is lighter, yet, as there are more fittings and their size larger—for a ewer and a washing-dish are usually included—in the aggregate there is a much greater weight of silver given in proportion to the amount paid. This is in some measure due to the almost nominal duty on silver plate in France, which is only 11 francs per kilogramme ($3\frac{1}{4}d.$ per troy ounce of 480 grains). It contains 50 parts of alloy

in 1,000, with a toleration of a farther quantity of alloy, not to exceed 11 parts per 1,000. The French have not yet succeeded in the manufacture of Russia and other better classes of leather dressing-cases, and but few examples are to be found in their Section; these appertain to the class of goods belonging to Class XVII., the Jury for which has examined them.

In 1847 there were in Paris One hundred and fifty-eight dressing-case, work-box, and writing-case makers, employing Nine hundred and eighty workpeople (882 men, 30 women, 68 boys), who manufactured goods valued at 155,120*l*.*

PERSIA.

The Persian Court contains examples of inlaid and japanned Work-boxes, and also a Pen-case, which are contributed by Mr. MILLS, jun., who states that they were collected by his father during his residence in that country. They may, therefore, be considered as truly representing this description of manufacture in Persia.

PORTUGAL.

HIS MAJESTY THE KING OF PORTUGAL contributes an elegant Ebony Writing-case, inlaid with ivory.

SAXONY.

One Exhibitor in the Saxon Department, W. ROCKHAUSEN (No. 172), sends several creditable Glove-boxes, made of rosewood and sycamore, some inlaid with mother-of-pearl. The prices of these are 42*s*., 45*s*., and 60*s*. per dozen. There is also a lady's Dressing-case in his collection, valued at 60*s*., which, from its simplicity, recalls the remark of Böttiger, after describing the Roman toilet-box before spoken of, when he says, "Our ladies are generally satisfied with boxes of atlas (satin) or rosewood, inlaid with brass or silver, while the ancient fair condescended not below silver materials, and the workmanship of a sculptor."

SWEDEN.

The Swedish Court contains a Writing-case which calls for no particular comment.

UNITED KINGDOM.

The Exhibitors of Dressing-cases and Work-boxes principally, but also of Desks, in Classes XXIX. and XVI., are Nineteen in number. Beside these, there are Fourteen Exhibitors in Classes XXII., XXVI., XXVIII., and XXX., whose productions did not come under the notice of the Jury of Class XXIX.; and the fact that writing-desks and writing-cases are exhibited chiefly in Class XVII. has been already adverted to. Confining the present remarks, therefore, to the two first-named Classes (XXIX. and XVI.), it may be stated, that the general display of British dressing-cases, &c., is highly creditable to the numerous Exhibitors.

* *Statistique de l'Industrie à Paris*, Part II., p. 821.

Beside many examples of the more usual kinds of wood dressing-cases, remarkable for their cheapness and excellence, it comprises some examples of a more costly description, which, in comparison with those in the French Department, are, unquestionably, higher in price, even after making all allowances for the lower duty of silver in France. They are, however, exquisitely finished in all the details of the case and fittings, which are unsurpassed for excellence of workmanship. Indeed, the silver-work is far higher in point of finish than the French, a circumstance which has already been commented upon. In Leather Dressing-cases the British have no competitors, either for cheapness or excellence of workmanship; and the numerous examples which are displayed were highly praised by the Foreign Jurors.

It is chiefly within the last twenty years that Leather Dressing-case making has attained its present high state of development; and this is principally to be attributed to the liberal support of the better class of workmanship given by the leading houses in the trade, and to the judicious encouragement of the individual efforts of their workmen by a due appreciation of their merits. The improvements which have taken place within the last ten years in the manufacture of dyed leathers in England have also had a very beneficial effect on this branch of manufactures. The number of Leather-case makers in Great Britain is not large, there being only 468 workmen and 250 females. As the best description of work is produced principally in London, the greatest number of workmen are there employed, amounting to 308, the workwomen being only 20; whilst, in Sheffield, there are no less than 200 females, who are considered to be very skilful, and only 47 workmen, employed, who are chiefly occupied with the more common dressing-cases, and in making the better kinds of razor-cases. In Birmingham, there are 50 workmen and 30 girls, also engaged on articles of a second class. Beside these, there are many workmen employed in making wood dressing-cases and the various fittings; but the Reporters have not been able to ascertain their number. It may be remarked, that the glass trays and covers are made principally in London and Birmingham, whilst Sheffield produces the metal covers, and shares with London in the supply of the cutlery. The hinges, handles, and other metal work, are obtained chiefly from Birmingham.

One of the largest Exhibitors of Dressing-cases, Work-boxes, and Desks, in Class XXIX., is our colleague, Mr. J. J. MECCHI, who is, by his position of Juror, precluded from competing for a recompense. In justice, therefore, to the excellence of his productions, the following resolution was proposed to the other Jurors of this Class by M. Natalis Rondot, seconded by Viscount Canning, and carried unanimously, on the 23rd of July 1851:—

“M. J. J. Mechî a exposé une collection de Nécessaires-de-voyage, de Papeteries, de Tables- et Coffrets-à-ouvrage dans laquelle on trouve une remarquable diversité de modèles et d'ornements.

“Membre du Jury de la Classe XXIX, M. Mechî ne peut en raison de cette haute position recevoir aucune récompense. Le Jury regrette qu'il ne lui soit permis, pour cette raison, d'inscrire le Nom de M. Mechî parmi les plus dignes; mais il est heureux de constater la belle, importante, et intelligente fabrication des ouvrages que M. Mechî a exposés.”

WURTEMBERG.

Wurtemberg is represented by one firm, WEBER and Co., No. 86, who exhibits stained Sycamore Work-boxes. The sycamore is first coloured with an artificial ferruginous water, and, after staining, the block is cut up into veneers, which are used to cover the work-boxes. These are not ornamented with paintings like the Spa-wares of Belgium, already noticed.

There are Fifty Exhibitors in this subdivision. Of these are :—

5	5	40
5	5	40
		50
		50

The number of Exhibitors from the various countries is as follows :—

Austria	-	-	-	-	-	3	France	-	-	-	-	-	-	6
Belgium	-	-	-	-	-	5	Persia	-	-	-	-	-	-	1
British Colonies :—							Prussia	-	-	-	-	-	-	1
Ceylon	-	-	-	-	1		Portugal	-	-	-	-	-	-	1
Gibraltar	-	-	-	-	1		Saxony	-	-	-	-	-	-	1
India	-	-	-	-	1		Sweden	-	-	-	-	-	-	1
New South Wales	-	-	-	-	1	7	United Kingdom (beside 14 in Classes							
New Zealand	-	-	-	-	1		xxii., xxvi., xxviii., and xxx.)	-	-	-	-	-	-	19
South Africa	-	-	-	-	1		Wurtemberg	-	-	-	-	-	-	1
Van Diemen's Land	-	-	-	-	1									—
China	-	-	-	-	-	3								50
Egypt	-	-	-	-	-	1								—

LIST OF AWARDS.

ASPREY, CHARLES, 166 New Bond Street (Class XXIX., No. 50). Honourable Mention, for a beautiful set of Twelve malachite and or-molu Table-ornaments, the price of which was stated to be 240*l.*; and also for some Dressing-cases and Writing-desks.

AUCOC, sen., Paris (France, No. 1052). Prize Medal (*the same Award by the Jury of Class XXIII.*), for a collection of very rich and elegant Dressing-cases; some with silver and others with *vermeil* (or silver gilt) mounts and fittings. The most remarkable objects are: a Dressing-case of Yew (*Bois d'if*), value 80*l.*, with chased silver mounts and fittings; and a Lady's ebony Dressing-case, value 400*l.* It is furnished with *vermeil* fittings, comprising, besides numerous trays and jars, a square washing-basin and ewer, also of *vermeil*. Taking the weight of silver and the amount of workmanship into consideration, the prices quoted were considered to be very reasonable.

AUDOT, L. D. J., Paris (France No. 11). Prize Medal (*the same Award by the Jury of Class XXIII.*), for a collection of very excellent and tastefully ornamented Toilet-boxes, comprising a Lady's Dressing-case of ebony and buhl, with silver mounts, valued at 300*l.*, and containing 183 ounces troy of silver; a rustic ebony and buhl Dressing-case (180*l.*), containing 148 ounces troy of silver; and a

Gentleman's ebony and buhl Dressing-case, with elegant silver mounts, the price of which was 57*l*. The prices of these and other articles were considered to be very reasonable.

AUSTIN, GEORGE, Dublin (Class XXIX., No. 36). Honourable Mention, for a Lady's Dressing-case, with silver fittings, and a Gentleman's Dressing-case, made of Irish bog-yew, also with silver fittings; and for Writing desks of Coromandel-wood, which are more remarkable for the goodness of the workmanship than for any excellence in the ornaments. The price of the Lady's Dressing-case is 90*l*., and that of the Gentleman's 80*l*.

EDWARDS, T. J., King Street, Holborn (Class XXIX., No. 89). Prize Medal, for Dressing-cases and Writing-desks of the very highest class of workmanship, both as regards the box and the mounts, but very high in price. In the construction of the boxes a friction-hinge is employed, which excellent contrivance admits of the various compartments remaining open to any required extent and avoids the necessity for numerous loose trays. The more remarkable objects supplied by this Exhibitor are a Lady's Dressing-case, with silver-gilt fittings, value 160*l*., a Gentleman's Dressing-case, and a Gentleman's Writing-desk, value 50*l*. The Lady's Dressing-case contains a tooth-brush tray, 2 soap-trays, nail-brush tray, a tooth-powder tray, a salve-box, 3 scent bottles, 2 large jars, 2 pairs of scissors, 2 button-hooks, a piercer, 2 corkscrews, 2 pen-knives, tweezers, 2 bodkins, 2 pearl-backed hair-brushes, 2 tortoiseshell hair-brushes, 2 tortoiseshell combs, a shoe-horn, ink-bottle, a gold pen, a gold pencil-case, and a blotting-book.

LAURENT, F., Paris (France, No. 564). Prize Medal, for great excellence in workmanship and in the design of numerous caskets, the most remarkable of which are, an Ebony and Buhl Dressing-case, with silver mounts, value 127*l*.; a Buhl Jewel-box, 7*l*. 10*s*.; a Buhl Writing-desk and Papetiere, 20*l*.; and a Shawl-box, 26*l*.

LEUCHARS, WM., 38 Piccadilly (Class XXIX., No. 44). Prize Medal (*the same Award by the Jury of Class XXIII.*), for various Dressing and Travelling-cases, tastefully designed, and of excellent workmanship. The following are some of the articles deemed worthy of special notice:—A Lady's Dressing-case of walnut-tree, clamped with pierced silver plates and corner-pieces in the mediæval style, and fitted with a variety of silver-mounted toilette-bottles, with a looking-glass and candle-holders, the value of which was stated to be 300*l*.; a very convenient Sac-de-voyage for a gentleman, in plain morocco; and a cylindrical morocco case containing a plated travelling Tea-equipage, including a tea-pot, an apparatus for boiling water, and knives and forks, the price of which is 18*l*.

MARIN, JONA STEPHEN, Spa (Belgium, No. 414). Honourable Mention (*Prize Medal awarded by the Jury of Class XXVIII.*), for a large collection of Spaware, comprising numerous examples, all well manufactured and embellished with fair copies of paintings, and original and tasteful groups of flowers. Work-boxes are exhibited, ranging in price from 2*l*. to 5*l*. 5*s*. each, and Blotting-cases from 3*l*. to 5*l*. each, according to the amount of work in the ornament.

MISSEN, E. and L., Spa (Belgium, No. 412). Honourable Mention (*the same Award by the Jury of Class XXVIII.*) for several well-finished articles of Spaware, comprising Work-boxes, Netting-boxes, in nests of five sizes, &c., ornamented with paintings, for the most part very creditably executed. The pieces most

deserving of notice are, a large Work-box, 3*l.* 8*s.*; one somewhat smaller, embellished with a representation of a Spanish bull-fight, 3*l.* 4*s.*; and Netting-boxes, from 2*s.* upwards.

STRUDWICK, THOMAS, 14 New Bond Street (Class XXIX., No. 42). Honourable Mention, for Dressing-cases of the cheaper description, but yet of very good workmanship. As an example may be cited a Gentleman's Dressing-case, made of yew and clamped on the outside with ornamental German silver plates and corner-pieces, the mounts and covers of the trays and jars being of solid silver. It contains 3 scent-bottles, an ink-box, a light-box, tooth and nail-brush trays, a shaving-soap-box, a square soap-box, a tooth-powder-box, 2 salve boxes, 2 razors—2 pair of scissors, a nail-file, a punch, a button-hook, 4 tooth instruments, and 2 penknives. The price of this case is only 38*l.*

II.—PARASOLS AND UMBRELLAS.

1. *Parasols*.—The first employment of those portable protections from the sun and rain called Parasols and Umbrellas, probably commenced with the former of those inventions, in a region where the intensity of the light and heat rendered a shade almost indispensable. In the contrivance of such a shelter, the pole and top of a tent seem to have originally suggested the well-known form, which, in its general features of a dome or a canopy still remains unaltered. But as the materials of the ancient parasol rendered it a heavy instrument, it appears to have been always carried by an attendant over the head of the owner. Hence it became an indication of high rank. The recent discoveries at Nineveh, show that the Parasol “was generally carried over the king in time of peace, and sometimes even in war. In shape,” continues Dr. Layard, “it resembled very closely those now in common use; but it is always seen open in the sculptures. It was edged with tassels, and was usually adorned at the top by a flower or some other ornament. On the later bas-reliefs, a long piece of embroidered linen or silk, falling from one side like a curtain, appears to screen the King completely from the sun. The parasol was reserved exclusively for the monarch, and is never represented as borne over any other person.” It will be remembered, that this interesting statement refers to the Assyrian empire, between the years 1200 and 606 before the Christian era.

There appear to have been more than one species of sun-shade proper to Egypt, as represented in the sculptures and paintings of that country. Of these, one appears to have been either a fan of palm-leaves or coloured feathers, fixed upon a long handle; in other cases, the figure seems intended to represent the canopy of a parasol, drawn with the imperfect skill of an Egyptian artist. Sir Gardner Wilkinson has engraved a delineation of an Ethiopian princess, travelling in her chariot through Upper Egypt to Thebes, wherein the car is furnished with a kind of umbrella fixed on a tall strong staff rising from the centre; and in its arrangement closely resembling the chaise-umbrellas of the present time.

From the very limited regal use of the parasol in Asia and Africa, it seems to have passed both as a distinction and a luxury into Greece and Rome, especially in the declining ages of those countries. The *Skiadeion*, or Day-shade of the Greeks, was carried over the head of the effigy of Bacchus; and the daughters of

the aliens at Athens were required to bear parasols over the heads of the maidens of the city, at the great festival of the Panathenæa. At Rome, when the veil could not be spread over the roof of the amphitheatre, it was the custom for females and effeminate men to defend themselves from the sun with the *Umbrella* or *Umbra culum* of the period; and this covering appears to have been formed of skin or leather, capable of being raised or lowered as circumstances might require.

Although the use of the parasol was thus early introduced into Italy, and had probably been continued there as a vestige of ancient Roman manners, yet so late as 1608, Thomas Coryat notices the invention in such terms as indicate that it was not commonly known in his own country. After describing the fans of the Italians, he adds, "Many of them do carry other fine things of a far greater price, that will cost at least a ducat (5s. 6d.), which they commonly call in the Italian tongue *Umbrellaes*, that is, things that minister shadow unto them for shelter against the scorching heat of the sun. These are made of leather, something answerable to the form of a little canopy, and hooped in the inside with divers little wooden hoops that extend the umbrella in a pretty large compass. They are used especially by horsemen, who carry them in their hands when they ride, fastening the end of the handle against one of their thighs; and they impart so long a shadow unto them, that it keepeth the heat of the sun from the upper part of their bodies."

It is probable, that a similar contrivance existed at the same period in Spain and Portugal, whence it was taken to the New World. Defoe, it will be remembered, makes Robinson Crusoe state that he had seen Umbrellas employed in the Brazils, "where they were found very useful in the great heats which are there;" and that he constructed his own instrument in imitation of them. "I covered it with skins," he adds, "the hair outwards, so that it cast off the rain like a pent-house, and kept off the sun so effectually, that I could walk out in the hottest of the weather with greater advantage than I could before in the coolest." In commemoration of this ingenious production, one species of the old heavy Umbrellas was called "The Robinson."

But the use of such a defence against the heat was not unknown in England, though probably only used as a luxury, even in the early part of the seventeenth century. Ben Jonson mentions it by name in a comedy produced in 1616; and in 1640 it occurs in Beaumont and Fletcher's "Rule a Wife and have a Wife," when Althea says—

"Are you at ease? Now is your heart at rest?
Now you have got a shadow, an Umbrella,
To keep the scorching world's opinion
From your fair credit."—

As a canopy of state, the use of the Umbrella appears to have been general in Southern Europe from a very early period: it is found in the ceremonials of the Byzantine Church; it was borne over the Host in processions; it formed part of the pontifical regalia; and about A.D. 1179, when Pope Alexander III. took refuge in Venice from the Emperor Frederick I., he bestowed on Sebastiano Zani, the Doge and his successors, the privilege of placing the Pontifical parasol over their armorial ensigns.

Without, however, attempting to trace any further the frequent appearance of the parasol in the early history of Europe, we may be allowed to make a few

statements regarding the Parasol of the Chinese. According to the statement of Dr. Morrison, Parasols and Umbrellas in the Celestial Empire appear to be first referred to in books printed about A.D. 300;* the tradition being, that the *San*, which signifies to cover or shade off the sun and rain, originated "in standards and banners waving loose in the air." This date, however, has been recently proved to be many centuries too modern, by the evidence of a very curious book of Chinese ceremonies, entitled *Tcheou-Li*, or The Rites of Tcheou, for the first time translated and published by the late M. Biot.† The author of the work was Prince Tcheou-Kong, brother of Wou-Wong, the first Emperor of the Tcheou dynasty, who wrote it at the beginning of the twelfth century before the Christian era. In this valuable work is contained a descriptive detail of the duties of the several officers belonging at the period to the Chinese court; and it directs that the workmen making the wheels of the Imperial carriages should also place the *dais* upon the cars. The figure of this dais‡ contained in the Chinese edition of the *Tcheou-Li*, and the particular description of it given in the explanatory commentary of Lin-hi-ye, both identify it with an umbrella.§ The latter describes the dais to be composed of 28 arcs, which are equivalent to the whalebone ribs of the modern instrument, and the staff supporting the covering to consist of two parts, the upper being a rod 3-10ths of a Chinese foot in circumference, and the lower a tube 6-10ths in circumference, into which the upper half was capable of sliding.

It is probable, that the most general use of the Parasol in France and England was adopted from China, about the middle of the seventeenth century. At that period, pictorial representations of it are frequently to be found, some of which exhibit the peculiar broad and deep canopy belonging to the *Lo San*, or large parasol of the Chinese officers of Government, carried by attendants. In 1664, Evelyn states, that a Jesuit showed him such a collection of varieties as he had never seen before, sent from the missionaries of Japan and China to their order at Paris, to be preserved in their repository; but brought for them to London by the East India ships. In the engraved title-page to his *Kalendarium Hortense*, published in the same year, a black page is represented as bearing a closed umbrella or sun-shade.

2. *Umbrellas*.—In the preceding notices, these artificial shades have been regarded chiefly as protections against the light and heat of the sun, with but slight reference to their equally great value as defences against rain. Their adoption for this purpose appears to have been much later than their use in the former capacity, and to have been but very slowly established in England. It is, however, mentioned by Gay, in his *Trivia*, so early as 1712, in one of his many vivid descriptions of the manners at the beginning of the last century; and he appears to affirm that any defence, excepting from the rain, could never be required in the streets of London. The verses in question are suggestive of two very curious observations connected with the history of the articles under con-

* Dr. R. Morrison's *Chinese Dictionary*, vol. i., part 2, p. 694, No. 8802.

† *Le Tcheou Li, ou Rites des Tcheou : Traduit pour la Première fois du Chinois par feu Edouard Biot*. Paris, 1851. 8vo. Vol. II., p. 475.

‡ M. Biot's Translation, p. 488.

§ *Ib.*, p. 478.

sideration. From the beginning of the present century, the use of the Parasol as a protection against the sun has been increasing in England until it has become universal amongst females, contrary to the declaration of the concluding lines. The Umbrella, on the contrary, though apparently well known in Gay's time, did not come into general use until the close of the last century. Jonas Hanway is stated to have been one of the first men who commonly carried one, for it was usually regarded as proper to females only;* and he, probably, brought the practice from Persia or from the Continent. In the *Statistical Account of Glasgow*, by Dr. Cleland, it is related that about the year 1781 or 1782, the late Mr. John Jamieson, surgeon, brought with him an Umbrella on his return from Paris, which was the first seen in the city, and attracted universal attention. The earliest specimens of the English Umbrella were made of oiled-silk, which, when wet, were exceedingly difficult to open or to close: the stick and furniture were heavy and inconvenient, and the article generally very expensive.† Its transition to the present convenient portable form, is due partly to the substitution of silk and gingham for the heavy and troublesome oiled-silk, which admit of the ribs and stretchers being made much lighter; and also to the many ingenious mechanical improvements in the framework which have been made from time to time, chiefly by English and French manufacturers, several of which have been patented. No change has proved a greater convenience than that from the old-fashioned ring and string, for securing the Umbrella when closed, to the clip and Indian-rubber braid; and yet, before this was accomplished, many transitions had to be passed through, which must be familiar to most persons: these outward improvements may be taken as the type of numberless others which are not appreciated, because they are not generally seen and understood.

We may now pass to the consideration of the various contributions from the different countries, first, however, premising that from England and France the largest quantities have been received.

AUSTRIA.

The Parasols and Umbrellas of Austria are gaudy, and not very well finished, and indeed, evince but little skill or taste on the part of her Two manufacturers who exhibit the finished articles.

Notwithstanding this, it appears that they are exported to some extent to several of the Mediterranean markets, for which it appears that they are well adapted. The prices at which they are sold are considerably higher than those for which goods of a better quality can be furnished by the English maker: in illustration

* That the use of the Umbrella was once considered as too effeminate for men, is remarkably illustrated by the following passage contained in *The Female Tatler* of Dec. 12, 1709:—"The young gentleman belonging to the Custom-house, that, for fear of rain, borrowed the Umbrella at Will's Coffee-house, in Cornhill, of the mistress, is hereby advertised, that to be dry from head to foot on the like occasion, he shall be welcome to the maid's pattens."

† An advertisement published in 1787 by Thomas Folgham, 112 Cheapside, states that he has "a great assortment of his much-approved pocket and portable Umbrellas, which, for lightness, elegance, and strength, far exceed anything of the kind ever imported or manufactured in this kingdom. All kinds of common umbrellas prepared in a particular way, that will never stick together."

may be cited the cheapest children's parasols of each of the two makers, which are sold wholesale at 1s. 1½d. and 2s. each respectively, and women's silk-parasols of very ordinary finish at 7s. and 9s. each. The other Exhibitors send merely parasol and umbrella handles, and sticks, which are generally reasonable in price, and of fair workmanship. The following are quotations of some of the cheapest, as well as the dearest of these productions. WEISS, J., Umbrella-sticks with bone handles, 9d. each; parasol sticks of white wood, and long bone-handles, 1s. and 1s. 3d. each; TIFEE, A., carved bone Umbrella-sticks, with handles of bone, 2s. 6d. and 3s. 6d.; with ivory handles fairly carved, 10s. 6d. each; LANDRA, J., Umbrella and Parasol sticks of carved wood, 4½d., 5d., and 10½d. each; these latter were considered to be cheap. The ivory and bone carving, however, bears no comparison in point of design and execution with the carving of the Meerscham pipe-bowls reviewed in another article.

BELGIUM.

The contributions from Belgium consist of Parasols only, and were sent chiefly by One Exhibitor; for although parasols covered with rich lace are exhibited in the North-East Gallery with other articles of lace, they cannot be regarded as appertaining to this branch of trade.

The Parasols exhibited (No. 432) are well manufactured, but are not in such good taste as those made in France; whilst at the same time they are dearer than similar goods sent by the English makers. The prices quoted vary from 20s. to 25s. each for plain parasols covered and lined with silk.

BRITISH COLONIES.

The richer contributions from the East Indies and the Island of Ceylon consist of State parasols or umbrellas, many splendid examples of which adorn the Indian Courts. The most remarkable example is the gorgeous State-umbrella from Moorshedabad, exhibited by his HIGHNESS THE MAHARAJAH OF NAGPOOR. This beautiful object is represented in the *Illustrated Catalogue*, page 924. The ribs and stretchers, which are gilt, are 16 in number, and divide the umbrella into as many segments, covered with silk exquisitely embroidered with gold and silver ornaments; the upper part of the design is complete in each compartment, but at the lower it is formed into a graceful running border, to which a fringe is fastened. The handle is hollow, and is formed of thick silver plates. Other examples contributed by his HIGHNESS THE RAJAH OF DHOLEPORE comprise the *Soorooj Mookkee*, or native parasol, covered with rich damask silk, and having likewise a silver handle; and the gold umbrella with silver top and handle, and enriched with gold fringe. Of the more usual descriptions may be cited several specimens of Bengalee *Chattahs* or small umbrellas, conical in form; with manifold plaits and consequently ribs and stretchers; these chattahs are composed of the leaves of *Licuala peltata*, and are the description used by the poorer classes of natives of Bengal during the rainy season. Of the same class is an umbrella made in Gowhattee, of the same material, but used by the higher classes of natives in Assam. There is also a conical umbrella of painted and varnished cloth, made in Calcutta; and, as if to illustrate how difficult it is for the native taste to adapt

itself to European requirements, there is a very inferior imitation of an English umbrella, having ten ribs, covered with crimson calico, and lined and fringed with dark green: this umbrella, it appears, is generally used by Europeans throughout India.

CHINA.

In China the Umbrella is still a mark of high rank, but not exclusively so; it must not, however, be inferred that it is as commonly used amongst the middle classes of society as in England, as this is far from being the case, for it is not their custom to go out when it rains, and the poorer inhabitants of China depend chiefly on appropriate clothing to protect them from the sun and rain; for example, the Chinese boatman, thatched in with his coat made of straw, and hat composed of straw and split bamboo, may defy the heaviest shower. Coats made of skin, usually with the fur outside, likewise afford effectual protection, so that, unless the foot passenger desires to go short distances in his ordinary habiliments, the umbrella is unnecessary.* These remarks, taken from an entertaining paper in the *Penny Magazine*, Vol. IV., p. 479, entitled, "Umbrellas in the East," are evidence that the umbrella is not an article of such paramount importance in China as in England; and yet Umbrellas and Parasols are made in considerable numbers in the provinces of Kwang-tung, Fo-kien, and Hoo-kwang, and form an important branch of commerce. They are exported from Canton, Amoy, and Shanghai, to India, the Indian Archipelago, and even to South America; in 1846, 300,000 were sent out from these ports.† Almost all the parasols and umbrellas are covered with oiled paper, which is afterwards painted and varnished. At Canton umbrellas are termed *Kittysols*, from the Spanish word *quitasol*; the Chinese name is *Chi-yu-san*, or *Yu-che*. Two examples only are exhibited in the Chinese Court; they are contributed by HEWETT and Co., but present nothing remarkable, beyond the great number of ribs which amount to forty-two. These ribs are formed of wood; and instead of being embraced by the fork of the stretcher, as is the case in European umbrellas, they have a groove cut in the middle of their length, into which the stretcher is secured by a stud of wood. The head of each rib fits into a notch formed in the ring of wood, which is fastened on to the top of the stick, there being a separate notch for each rib. The slider is of wood, and has forty-two notches, namely, one for each stretcher, which, like the ribs, is formed of wood. The covering of the umbrellas exhibited is of oiled paper coarsely painted.

FRANCE.

In the higher class of Umbrellas and Parasols, France undoubtedly stands pre-eminent. The tasteful designs and sharp and excellent carving of the ivory handles, and the artistic grouping of the colours of the various silks used in the manufacture of parasols, and the supple dressing of the silks for umbrellas,—give to the French manufactures a decided superiority; added to which, the frames were much lighter and neater than those made in England until a very recent period. The French parasols and umbrellas have, in consequence of their lightness

* In Alexander's *Costume of China*, Part 8, is a plate representing a group of Chinese, habited for rainy weather, which accords with this description.

† *Etude pratique du Commerce d'Exportation de la Chine*. Par Natalis Rondot. pp. 117, 118.

and elegance, acquired a high reputation in America and Italy, to which countries large quantities are annually exported, as well as to the French colonies. Taking an average of the annual exports of Silk Umbrellas and Parasols from 1827 to 1836 inclusive, their value was 36,360*l.*; between 1837 and 1846 it was 54,172*l.*; and in 1847 it had reached to 70,088*l.*; so that in 20 years the exports had nearly doubled in value. To obtain, however, the true exponent of the Annual Exports in Umbrellas, must be added the average value of the uncovered frames exported in the same years; in the first-named period it was 7,160*l.*, in the second, 9,160*l.*, and in 1847, 9,280*l.*; so that the value of the umbrellas, parasols, and frames which were exported in that year was 79,368*l.* Whilst the foreign trade of France has been rapidly increasing as regards silk umbrellas, she has lost ground in those covered with gingham, in which her trade was never large, owing to the competition of the English makers. Thus, from 1827 to 1836, the mean annual value of the Exports was 1,240*l.*; from 1837 to 1846 it was 960*l.*, and in 1847 it was reduced to 480*l.* According to the *Statistique de l'Industrie à Paris*, Part II., p. 825, &c., it appears that in 1847 there were in Paris 377 masters engaged in the business of umbrella and parasol making, and employing 1,429 workpeople (601 men, 742 women, 45 boys, 31 girls); who, according to M. Natalis Rondot's estimate produced goods to the amount of 296,320*l.* in that year; not much more than one-fourth part of which was exported, as will be seen by comparing the foregoing figures. In 1850 the exports were somewhat less than in 1847; thus the value of the silk umbrellas and parasols was 57,380*l.*, of gingham umbrellas 89*l.*, of umbrella and parasol-frames 9,095*l.*, making a total of 66,564*l.*

Besides the umbrella mounters and finishers, there were in 1847 in Paris 74 manufacturers, employing 304 workpeople (264 men, 6 women, 34 boys), engaged in the production of sticks, handles, and tips; whose returns were 30,400*l.*

Of the 377 parasol and umbrella mounters and finishers,—

	31	employed more than 10 workpeople.
163	„	from 2 to 10 „
122	„	- - - 1 assistant.
61	„	- - - no „
377		

			£.	£.
9	produced goods to the value of	-	-	8,000
8	„	„	from 4,000 to	8,000
14	„	„	„ 2,000 „	4,000
32	„	„	„ 1,000 „	2,000
75	„	„	„ 400 „	1,000
65	„	„	„ 200 „	400
138	„	„	„ 40 „	400
36	„	less than	- - -	40

Parasols and Umbrellas were formerly made by the corporate body of "*Bour-siers*" (leather-purse-makers), who were at the same time breeches-makers, cap-makers, collar-makers, brace-makers, powder-puff—game-bag—and travelling-bag-makers. In 1754, says M. Natalis Rondot, there were 250 master purse-makers in Paris; and quoting the *Journal du Citoyen* of that date, he remarks, that folding parasols sold at from 12*s.* to 17*s.* 6*d.* each, and common parasols from 7*s.* 3*d.* to

11s. 3d. each. Two questions naturally suggest themselves—what was the form of these instruments, and what their weight? fortunately both questions can be answered satisfactorily. In the well-known French Encyclopædias * there are plates representing the whole of the objects made by the “*Boursiers*” and the tools employed in their manufacture. The usual parasol or umbrella of that period which is there figured, closely resembles the ordinary gig-umbrella of the present day, and, slightly modified in form, is still used by the peasantry of France. The folding parasol was constructed with jointed ribs so as to fold back, and was likewise self-opening. The rod was a metallic tube, and contained a spiral spring which acted upon and pressed upwards an inner rod. To this inner rod were jointed the stretchers, which in this construction were placed above the ribs instead of below, as in the ordinary form; besides which they were much shorter so as to admit of their being concealed by the covering. By the elasticity of the spiral spring contained in the hollow stem, the inner rod was pressed outwards and lifted the stretchers, and by their means raised the ribs also, so that in its ordinary or natural state the umbrella was always open, and would continue so unless constrained to remain closed by a catch. On releasing the catch it consequently sprang open. In order that it might be easily closed, four cords were attached to four of the ribs and passed to the handle; and a loop embracing these cords passed down by the side of the handle, and enabled the possessor to close his umbrella without difficulty. From the authority already quoted we learn that whalebone was employed for the ribs, and that their number varied with their length: for example, when 24 inches long, the number employed was 8; when 25 inches, 9; and when 26, 28, and 30 inches, 10 were used. Calico was employed to cover umbrellas and silk to cover parasols. The use of parasols was common in Lyons at that period (1786)—they were carried by men as well as women; “they were rose-coloured, white, and of other colours, and were so light as to be carried without inconvenience.” In Vol. V. of the *Dictionnaire des Arts et Métiers*, published in 1788, and forming part of the *Encyclopédie Méthodique*, mention is made of parasols contained in walking-sticks, which fly out by the action of a spring as soon as a catch is released. The comparative “lightness” of Parasols may be judged of by the annexed statement, which relates to umbrellas of different periods from 1645 to 1849, contributed to the last French *Exposition* in the latter year by M. Farge—

Umbrellas of	Length of ribs. Inches.	Weight. lbs. oz.
1645	31½	3 8½
1740	29	1 13
1780	28¾	1 8½
1840	27½	0 13¼
1849	27	0 8¾

Hence it appears that the Umbrella of the present day weighs only one-seventh of that of a century ago. From 1808 to 1848, a period of 40 years, there were 80 Patents of invention, 3 of importation, and 41 for improvements relating to the Umbrella-trade taken out in France. Some of these are for mechanical con-

* Diderot and D'Alembert's *Encyclopédie ou Dictionnaire Raisonné des Sciences, des Arts et Métiers*. Paris, 1751-1765. Recueil des Planches, Tom. I. *Encyclopédie Méthodique*. Paris, 1782-1830. Section Arts et Métiers, vol. vi. (1786).

trivances allied to those before described; some are for improvements in the ordinary frames, and others for the adaptation of machinery as a substitute for hand-labour. With all this, the productions of France must be characterised as high in price, the ordinary wholesale price of a good silk-umbrella, of the self-opening construction, ranges from 20s. to 40s., and that of parasols from 13s. to 80s.; but then they are in every respect exquisitely finished. The French manufacturer is also famous for many ingenious contrivances: for example, with respect to Travelling-umbrellas which may be removed from the stick and packed in a portmanteau or placed in the pocket, and others too numerous to mention in detail.

PORTUGAL

The Umbrellas in the Portuguese Department, Nos. 1127 to 1143, and the Parasols, Nos. 1144 to 1150, comprising about 30 varieties, are contributed by One Exhibitor, and may be characterised as creditable, though not remarkable, productions. The umbrellas are both with whalebone and steel ribs, covered with black silk, and have ivory and wood handles. The parasols are also made with metal frames, some for ladies', others for children's use, and are covered with plain and striped silks.

PRUSSIA.

The contributions from Prussia are from only One Exhibitor, and consist merely of Umbrella and Parasol handles, which are sold at low prices. In 1846 Prussia possessed Seventy-seven manufactories of umbrellas and parasols, which gave employment to Five hundred workpeople.

TUNIS.

The Tunisian Court contains many examples of Parasols, some of which are made of leather and silk, and others of silk adorned with ostrich feathers.

TURKEY.

Although we have not to cite any examples of umbrellas or parasols as having been sent from this country, yet, in treating of these articles, it is desirable to allude to the very prevalent employment of these useful shelters by the *middle-classes* of Turkey as a remarkable instance of the introduction of European customs into that country. So much, however, still remains of the regal attributes of the umbrella, that, in passing before the palace of the Sultan, the custom is to lower it; a compliment which the sentinel on duty does not fail to enforce from the foreigner who, unconscious of the forms of society, may happen to pass with his umbrella elevated.*

UNITED KINGDOM.

Whilst France stands pre-eminent for articles of the highest class, England is without a rival in the production of parasols and umbrellas of the plainer descriptions. This is to be attributed not so much to the introduction of new and expensive machinery (for it is still almost as simple as that figured a hundred

* *Penny Magazine*, vol. iv., p. 480.

years since in the French Encyclopædias before mentioned), as to the judicious subdivision of labour, and the importation *free of duty* of her colonial canes for the ribs and sticks; likewise whalebone for ribs, and lastly, *also free*, horn and ivory for the handles. Her cheap and abundant manufacture of gingham and plain silks, also gives her decided advantages over other nations.

It is not possible to determine with certainty the exact yearly produce in the parasol and umbrella trade which, for finished goods, is chiefly centred in London; but some idea may be formed of its importance when it is stated that several of the large city houses dispose of from 250 to 500 dozens of parasols and umbrellas weekly. The prices of the commoner kinds are marvellously low, as will be understood when it is stated, that children's gingham-parasols are sold wholesale from 4*d.* each, and women's from 10½*d.* each. Silk-parasols commence at 10½*d.* each, and gingham umbrellas at 7*d.* and 10*d.* each, according to the size. Alpaca-umbrellas range from 6*s.* to 12*s.* each, and silk-umbrellas from 3*s.* 6*d.* to 22*s.* each. To the price of the silk parasol there is scarcely an assignable limit, as any amount of expensive lace may be used to adorn it; the highest price quoted was 5*l.* 5*s.*, but the example was far less elegant than most of the specimens in the French Department, and much higher in price. Our umbrella-manufacturers would, indeed, do well to profit by the example of their French brethren, by calling artistic talent to their aid in devising new models. For there are many English artists who are capable of furnishing excellent designs for the ivory carver, and of superintending the carving of the first model; with whose aid we should gradually find *good engraving* taking the place of its present substitute *high-polish*, whilst the cost on each individual article would be very slightly increased. A little artistic help is likewise desirable in the assortment of harmonious tints; and, at the next Exhibition, there will be no examples of crimson parasols with yellow fringes.

We are indebted for the cheapness of the commoner umbrellas to three causes:—To the small cost of labour, attributable to the dexterity and industrious habits of the artisan; to the low price of gingham, which is sold at less than 3*d.* per yard; and to the employment of split-and-dyed ratan canes for the ribs in lieu of whalebone. M. Meyers (Class XXIX., No. 140) reports that his weekly sales of cane-ribs average 12,000 sets, eight to the set; the whole sale price of which is 10*d.* per dozen sets, or a little more than three farthings for each umbrella. Although ratan canes are used for some other purposes, the statement of the quantity imported into the United Kingdom, during the last ten years, will not be deemed out of place in the present Report.

RATAN CANES (not Ground-ratan).

Years.	Number Imported.	Number entered for Home-consumption.
1841	6,784,379	4,949,609
1842	4,101,369	4,687,757
1843	4,181,050	4,865,195
1844	8,145,757	8,293,984
1845	10,667,036	Free, and therefore no
1846	8,794,776	account taken.
1847	12,324,768	
1848	7,974,413	
1849	4,723,364	
1850	12,760,726	

A large quantity of whale-fins is likewise imported, and is consumed principally in the manufacture of umbrella-ribs.

Whale-fins Imported during the last Ten Years into the United Kingdom :—

Years.	Imported. Cwts.	Entered for Home-consumption. Cwts.
1841	6,369	6,272
1842	4,348	4,368
1843	6,609	6,297
1844	8,041	7,160
1845	11,484	Free, and therefore no account taken.
1846	9,101	
1847	8,128	
1848	7,765	
1849	8,926	
1850	9,498	

It has been previously stated, that one element of cheap production is the low price paid for labour. This position we now proceed to illustrate, first remarking that the putting-together of umbrella and parasol frames with cane and whalebone ribs, is chiefly done by small masters in London, who employ lads to assist them; that the covering is performed by women and girls at their homes; and that in the lowest-priced goods, the joint labour of an entire family is necessary to eke out a subsistence. The fixing of the handles and ferrules is often done at the warehouses.

In order that the reader may better appreciate the small amount of the wages paid for putting the frames together, the subjoined description of the various processes is given. The frame-maker requires a capital of from 3*l.* to 6*l.*, in order that he may erect a couple of very primitive-looking lathes with a circular saw; a rose-cutter for forming the tips, and several drills, all of which screw into the mandrils of the lathes; also a paring-knife, a small vice, and three or four pairs of pliers; and lastly, a "weighing-board." The circular saw, rose-cutter, and paring-knife are comparatively modern improvements. He must rent a room or shop, and pay for fuel and candles. He has likewise to provide all the iron-wire and brass-plate out of what he receives in wages; but the stick, ribs, stretchers, and runners are furnished to him. In order to work economically he must employ two lads, but he usually finds it more to his interest to employ four, to whom he pays 4*s.* per week.

1. *Preparing the Stick.*—The stick, which is usually of stained beech, is first sawn off to a length; one end is tapered with the paring-knife to prepare it for receiving the ferrule; two grooves are cut in with the circular-saw in the direction of the length of the stick, in order to receive the two springs, one for sustaining the umbrella open, and the other for keeping it closed. The springs are then made out of iron wire and fastened one in each groove, the fastening being effected by simply driving one end of the spring into the handle: the other is left free, but is prevented from flying out by means of a cross-wire, the insertion of which requires two operations, viz., drilling a hole and inserting and riveting the wire. A stopper is formed by bending a piece of wire like a staple, and it is then inserted into two holes drilled above the top spring in order to prevent the slider from going too far; lastly two holes are drilled near the top of the stick, through these the cross-wire is inserted,

and when finished it presents the appearance of a double staple, one loop being on one side of the stick and one on the other. In preparing the stick it has passed at least *nineteen* times through the hand.

2. *Preparing the Ribs*.—Each rib is roughly tapered with the paring-knife at one end, and is rendered smooth and conical by holding it in the direction of its length in the groove of a wheel lined with fish-skin, which wheel is made to revolve rapidly in the lathe; the taper end of the rib is then held *across* a steel fly-cutter or “machine,” likewise running in the lathe, which cutter has a circular groove of the proper radius of curvature formed on its periphery. By rotating the rib in the hand, its “tip” is rendered spherical; the tip is then varnished and has a hole drilled in it to admit of fastening on the covering, and each rib is cut to the proper length by sawing off the opposite end: the “head” of the rib is lapped with thin brassplate and rounded, and is then drilled to admit of the “head-wire” on which it is afterwards hinged; the rib is lapped also near its centre with brass-plate, and drilled in order to admit of fastening on the stretcher; and lastly, the stretcher is attached by means of an axis of wire, the ends of which are riveted. Each rib passes not less than *thirteen* times through the hand; and, as there are eight ribs, the frame consequently passes *one hundred and four* times through the hand in this stage of the construction.

3. “*Weighing*” the Ribs.—Unless every rib be of equal strength the umbrella will not “set round,” hence the necessity for the “weighing” process. This operation is somewhat analogous to that which engineers employ in ascertaining the deflection of a beam, and is effected by a very simple instrument. The weighing-board is about 3 feet 6 inches long and 2 feet deep and is affixed to a wall, the longer side being parallel to the horizon; and there are in different parts of it a multitude of small holes for the reception of wire pegs. The rib to be weighed is placed *over* one peg close to its stretcher and *under* another peg, so far distant from the first as to reach nearly to the head of the rib; a small leaden weight is then hung on to the tip and of course deflects the rib, the amount of the deflection (indicated by graduations on the arc of a circle affixed to the board) gives the relative strength of the ribs, which are assorted out in sets accordingly. The weighing adds *eight* more operations to those already enumerated.

4. “*Threadling*” the Ribs.—Each stretcher, which it will be remembered is attached to the rib, is taken up in turn and threaded on to a wire, and is then inserted, each one in its respective place, in the notches of the slider, and all are made secure by binding the wire round the top of the slider, which is grooved for that purpose. The head-wire is now inserted through four of the ribs, and is then passed through the two loops of the “cross wire” at the top of the stick; and now the four remaining ribs are threaded, and the head-wire secured by twisting its ends together with pliers. Reckoning that this adds *four* operations, the frame will have passed *one hundred and thirty-five* times through the hands of the workman or his assistants.

All this labour is performed for $\frac{1}{2}d.$ to $\frac{3}{4}d.$ in the case of parasols, and for $\frac{3}{4}d.$ to $1d.$ in that of umbrellas. A workman can, nevertheless, earn fair wages at these prices provided he is supplied regularly with work; but he is frequently subjected to much loss by being kept waiting about in the wholesale warehouses, which sometimes occasions a loss of at least half a day to him. The prices just

quoted are those paid for the lowest description of work, but for putting together the frame of an umbrella with whalebone-ribs, the workman gets 2½*d.* Of the cheaper kinds of umbrellas, say those at 1*s.* per dozen, a workman and four lads can make four gross per week, for which he receives 48*s.* After deducting the wages of his lads, 16*s.*, and the cost of the materials he supplies, which is about 8*s.*, it leaves him 24*s.* for himself.

Covering of Umbrellas.—This is paid for according to the description of work, the commonest at the rate of 1s. per dozen, and the best, 4s. per dozen.

The frames, which are made of metal, are almost exclusively manufactured in Birmingham. The stick, ribs, stretchers, and ferrule, are all metallic, and require, after covering, merely the insertion of a long wood or ivory handle and the ferrule to complete the umbrella. These frames can be furnished at from 7*d.* to 10*d.* each; and although not so cheap as the cane-frames, they are consumed and exported in enormous quantities, in consequence of the small bulk which they occupy. Many improvements have of late years been made, not only in the machinery used for making the metallic frames, but also in the construction of the frame itself. Amongst those most deserving of notice, may be cited the improvements of Mr. Holland and Mr. Boss. Either of their constructions adds about 2*s.* to the price of an umbrella. In conclusion, it may be stated that the umbrella-manufacture in the United Kingdom is in a very prosperous condition, and is rapidly increasing.

WURTEMBERG.

There are Four Exhibitors of Umbrella-handles from this country, the carving on some of which is very humorous: the most important collection has been rewarded for other ivory goods which were exhibited at the same time, and which formed the largest proportion of the contribution. (See Toys, p. 1527.)

The number of Exhibitors of Parasols and Umbrellas, or their components, such as handles, sticks, and mounted frames, is Thirty-three ; of these, there are :—

5 Holders of a Prize Medal.
2 Who obtained Honourable Mention.
26 Unrewarded.
—
33

The number of Exhibitors from the various countries is as follows :—

Austria	-	-	-	-	-	-	-	-	5
Belgium	-	-	-	-	-	-	-	-	1
British Colonies (India and Ceylon)							-	-	2
China	-	-	-	-	-	-	-	-	1
France	-	-	-	-	-	-	-	-	3
Portugal	-	-	-	-	-	-	-	-	1
Prussia	-	-	-	-	-	-	-	-	1
Tunis	-	-	-	-	-	-	-	-	1
United Kingdom			-	-	-	-	-	-	14
Wurtemberg	-	-	-	-	-	-	-	-	4
									33

LIST OF AWARDS.

BOSS, ISAAC ABRAHAM, 6 Bury Street (Class XXIX., No. 146). Honourable Mention is accorded to this Exhibitor for several Mechanical Improvements in the construction of umbrella- and parasol-frames. One contrivance is to facilitate the opening of a parasol or umbrella. This is effected by means of a pin working in a groove close to the handle. The pin is fastened to a wire (contained in the hollow handle) acting on the ribs which overhang the joint so as to form short levers, so that by pulling the pin towards the handle the umbrella is opened. The price of the frames with this apparatus is 2s. 9d., one of ordinary construction being 10d.

CAZAL, — (France, No. 108). Prize Medal, for Parasols and Umbrellas elegant in form and of excellent workmanship. The carved ivory handles evince much taste and are well sculptured; the framing, which is very light, in many cases presents novelties of construction. The self-opening umbrella, for instance, may be cited as a very ingenious contrivance; the desired effect being produced by simply making each stretcher double, and so arranging the parts that a tension is put on one of the sets of stretchers in closing the umbrella, which consequently flies open as soon as a catch is released. A travelling-umbrella so arranged that the stick may be conveniently removed and used as a walking-stick, is also worthy of commendation. The prices of the umbrellas are, however, high, and range between 32s. and 100s. each. M. Cazal likewise exhibits Canes made of rhinoceros-horn, white whalebone, and conglomerated horn.

CHARAGEAT, E., Paris (France, No. 1144). Prize Medal, for Umbrellas and Parasols of first-rate workmanship. The designs and sculpturing of the handles are in all cases of the highest class. The case of this Exhibitor likewise contains numerous examples of ingenious mechanical contrivances, among which especially to be commended is an umbrella which closes of itself, when a spring near the handle is touched. The specimens, although equal in manufacture, and at the same time more moderate in price than those last mentioned, must still be considered as costly; umbrellas, for instance, range from 20s. to 60s., and parasols from 13s. (very plain) up to 80s. for the more elegant class, wholesale.

HOLLAND, HENRY, Birmingham (Class XXIX., No. 131). Prize Medal, for Parasol- and Umbrella-Frames of a novel construction, invented by him; the component parts of which are exhibited in various stages of progress so as to illustrate the plan of manufacture. This description of frame is distinguished from others chiefly in having ribs formed of rectangular steel-tubing, and is so light that when covered with strong silk to form an umbrella the whole instrument only weighs 9 ounces. This frame is now in very general use for the better description of umbrellas and parasols, to the cost of which it adds about 2s.

MORLAND, J., and SON, 50 Eastcheap (Class XXIX., No. 306). Prize Medal, for Parasols and Umbrellas of very excellent workmanship and at moderate prices. In the better class of goods, Holland's frames are employed. The umbrellas exhibited range in price from 3s. 6d. to 22s. wholesale, and the silk-parasols from 1s. 7d. (children's) up to 16s. each.

SANGSTER, WILLIAM and JOHN, 140 Regent Street (Class XXIX., No. 136). Prize Medal, for Silk Parasols and Umbrellas of excellent quality, and for their

application of Alpaca-cloth to the covering of parasols and umbrellas. Alpaca-cloth is made of the undyed wool of the Peruvian and Chilian sheep, and is therefore not liable to fade, nor is it acted upon by salt-water; hence Alpaca parasols and umbrellas are much used at watering-places, and are also largely employed as a cheap substitute for those covered with silk. Alpaca-parasols sell at 5s. each, and umbrellas at from 6s. to 8s. wholesale.

The consumption of Alpaca-cloth in the umbrella-trade, notwithstanding its recent introduction, is very considerable, for it appears that the production for this purpose amounted, during the last year, to the value of 25,000*l.*: its price is about 2s. per yard.

WIGDOR, M., Berlin (Prussia, No. 257). Honourable Mention. This Exhibitor contributes a great variety of Parasol- and Umbrella-handles manufactured from horn, bone, and ivory, which are deserving of Honourable Mention.

III.—WALKING-STICKS.

Whensoever the heroic period may be supposed to have existed, the staff, as employed for the support of old age, was then well known; since it is referred to in the enigma put forth by the Sphinx, and solved by *Œdipus*. "There is a Being," said the questioner, "which has four feet, and it has also three feet, with only one voice; but its feet vary, and when it has the most it is the weakest." "This is man," was the hero's answer, "who, when he is an infant, crawls upon his hands and knees; when he is a man, he walks uprightly; and when he is old, he totters with a stick."

The use of a staff for support in walking, appears to be so natural and inartificial, as not to require any illustration; and yet the Pilgrim's staff of the middle-ages, and the *Alpenstock* of the present time, have a certain amount of historical interest. The *Bourdon*, or *Pilgrim's* staff, was a strong and stout stick, apparently about five feet in length, armed at the lower end with an iron spike, and intended to supply a support and balance to the body, when the traveller was climbing up slippery paths or steep acclivities. About a foot from the top of the staff, was generally found a large protuberance, either artificially or naturally formed around the staff, on which the pilgrim's hand securely rested, without danger of sliding downwards. The lower part of the staff was altogether solid, but the upper joint was a hollow tube, capable of containing small articles, like a long circular box. It is probable that these articles were originally reliques of saints, or the "signs," as those emblematical figures were usually termed, which were commonly sold at the shrines to which pilgrims travelled, as proofs that they had really visited those sacred spots. In the later ages of pilgrimages, however, this part of the staff was sometimes converted into some kind of pipe or musical-instrument, such as sticks have frequently contained in modern times. Above the tube the staff was surmounted by a small hollow globe, and it was also furnished near the top on the outside with a kind of crook, for the purpose of safely sustaining a gourd-bottle of water. After the pilgrim had completed his votive journey, and returned from Palestine, he commonly brought with him a branch of palm, fastened into the top of his staff, as the proof of his travel into Palestine or Egypt. It is, however, unquestionable that the pilgrim's staff frequently became the recep-

tacle of secular articles. It is recorded by Holinshed, that in the hollow part of a pilgrim's staff the first head of saffron, afterwards so successfully cultivated at Saffron Walden, was secretly brought over from Greece, at a period when it was death to take the living plant out of the country. The silkworm also found its way to Europe in the hollow of a pilgrim's staff. So late, also, as the time of Cervantes, certain Spanish pilgrims existed, who had collected upwards of an hundred crowns in alms, which being changed into gold, they concealed in the hollow of their staves, or the patches of their clothing. It seems to be a natural observation in this place, that the ancient contrivance of making a repository in the hollow of a walking-stick is not yet obsolete. In the Great Exhibition, Dr. GRAY, of Perth, displayed a medical walking-staff, containing a variety of instruments and medicines; and the same principle has been also frequently employed for the portable conveyance of telescopes, instantaneous-light-apparatus, and many other important articles.

Several varieties of sticks were likewise exhibited, enclosing in them swords, dirks, and spring spears: the principle of construction of the sticks last mentioned being, that they required a heavy blow to be given with the armed end before the strong spring could be overcome which held back the spear-head. Sword-sticks, and dagger, or tuck-sticks, are of a more recent period; but this kind of weapon, walking-staves, is not of later invention than the last century; though that which contained fire-arms existed in the early part of the reign of Henry VIII.

The *Alpenstock* is another ordinary travelling-staff requiring to be noticed, of modern use, though of great antiquity. It is a stout pole of about six feet in length, provided with an iron spike at the lower end, and surmounted with a chamois' horn as an ornament. It is almost indispensable in mountain journeys, and may be procured for two francs throughout Switzerland.

Another order of Walking-sticks comprises those light wands to which the name is now exclusively attributed; and these also are descended from a time of considerable antiquity. The stem of the giant-fennel, the *Ferula* of Pliny, is the chief progenitor of this family, and he derives the origin of the name of the plant either from *fero*, from the stalk being employed in walking; or from *ferio*, because schoolmasters used it for striking boys on the hand. It would seem as if the latter interpretation had become established at an early period, since Martial terms the ferula, *sceptrum pedagogorum*; and even down to the present day the word popularly conveys no other meaning. The tough lightness of the fennel-wood rendered it especially fitted for a support to aged persons; whilst the imposing length of the staff gave an air of importance to those who carried it. Hence it became the prototype of those lighter wands which have continued as the sign of seniority or gentility to the present time.

In Oriental countries the substitute for the ferula was naturally some kind of native reed; and the employment of such a plant as a support, and also as an emblem of Egypt, is noticed, in probably a proverbial form, by the Assyrian general, Rabshakeh, in his speech to the servants of Hezekiah, in the eighth century B.C. "Now behold," says he, "thou trusteth upon the staff of this bruised reed, even upon Egypt; on which, if a man lean, it will go into his hand and pierce it." (2 *Kings*, xviii. 21.) The supposition that the ferula was supplied by some local plant must be also equally true concerning other regions, and especially in those

in which the bamboo was indigenous. This was probably the first kind of the cane tribe introduced into Europe; since the word cane in all its original forms appears intended to express a hollow tube or channel, for which purpose the bamboo is still extensively and constantly employed. Although the generic name of cane has long since supplanted all others for ordinary walking-sticks, yet at different periods they have been made of a great variety of materials. A slight glance may be taken at some of the substances employed, and some of the peculiarities of the common walking-sticks of other times.

In the Egyptian sculptures persons of importance or official rank are represented walking with tall slender staves, having the lotus-flower on the tops. Several ancient specimens of these sticks have been discovered in Egypt, made of cherry-wood and other substances, measuring from three to four feet in length, some being surmounted by a small knob or a flower, and others having a curved projection standing out on one side, like the tusk of a boar, as if it had been intended for the hand to rest upon.

At a very early period of the Sacred history the distinctive character of the staff carried by an individual is indicated from his immediate recognition simply by the production of it with his signet and his bracelets (*Genesis* xxxviii. 18-25). Homer has commemorated the "sceptre-bearing princes" of the Greeks, and especially the sceptre-staff of Achilles, adorned with golden studs: "I will swear a great oath," says the hero, "even by this sceptre, which shall never again bear leaves or shoots, nor will bud again from the time it left its trunk upon the mountains, when the axe stripped it of all its leaves and bark." These sceptres, although they were undisputably the insignia of rank and authority, were also evidently the usual walking-sticks of persons of the highest class. Agamemnon, it is stated, never went forth without bearing with him his paternal staff of royalty.

In the portraits of many of the noble personages of English history, painted in the sixteenth century, may be seen instances of the richness of the superior walking-sticks carried at that period, when they appear to have been tall, stout, and mounted and adorned with gold. In 1531 a cane-staff and a stone-bow were brought as a gift to Henry VIII. by a certain fletcher or arrow-maker, whom the king rewarded with forty shillings. Some far more curious instances of canes belonging to the same sovereign are, however, described in the manuscript inventory of the contents of the royal palace at Greenwich, in the following entries:—"A cane garnished with sylver and gilte, with Astronomie upon it. A cane garnished with golde having a perfume in the toppe; under that a diall, with a pair of twitchers and a pair of compasses of golde; and a foot rule of golde, a knife and a file of golde, with a whetstone tipped with golde."*

From the middle of the seventeenth century walking-sticks appear to have increased in luxury, both in regard of the mountings and also of the material of which they were manufactured, the improvements being derived principally from France. In the early part of the following century, the most fashionable sorts were made of certain fine marbles and agates, exhibiting either a splendid variety of colour or a rich semi-opaque plain tint, which was most expressively described by the English term "Clouded." These wands were made of the most slender pro-

* *Costume in England*, by F. W. Fairholt, p. 473.

portions, both on account of their specific gravity and the quality of the persons by whom they were to be carried; and they were often richly mounted with silver, gold, amber, or precious stones. Such were the "clouded canes" of the age of Pope and Gay, which were frequently so greatly valued as to be preserved in cases of shagreen or sheaths of leather. Every reader of "The Rape of the Lock" will remember—

"Sir Plume, of amber snuff-box justly vain,
And the nice conduct of a clouded cane;"

as well as Gay's commemoration of the same kind of walking-stick in "The Van:"—

"Here clouded canes, 'midst heaps of toys are found,
And inlaid tweezer-cases strew the ground."

The most curious account of the walking-sticks of this period is, however, contained in the "Tatler," No. 103, written by Addison and Steele, and published on Tuesday, 6th December 1709. In that paper Isaac Bickerstaff represents himself as issuing licences and regulations for the beaux of the time, as to the carrying of "canes, perspective glasses, orange-flower waters, and the like ornaments of life." The first part of the essay is intended to ridicule and abolish the prevailing absurd though fashionable practices connected with walking-sticks; hence the respective parties were licensed to carry them provided they did not walk with them under the arm, nor brandish them in the air, nor hang them on a button. One of the petitioners desires permission to retain his cane, because it had become as indispensable to him "as any other of his limbs," and because "the knocking of it upon his shoe, leaning one leg upon it, or whistling upon it with his mouth, are such great reliefs to him in conversation, that he does not know how he should be good company without it." The cane of this person being produced, it is described to be "very curiously clouded, with a transparent amber-head, and a blue riband to hang it on his wrist."

In the second half of the last century there was one peculiar form of walking-stick prevailing, which was generally used by females who were advanced in life. The sticks referred to were between five and six feet in height, taper, and slender in substance, turned over at the upper end in the manner of a shepherd's crook, and twisted throughout the whole extent of the wand. The materials were either wood, ivory, or whalebone, mounted with silver or gold, and sometimes they were formed entirely of a clear pale green glass. The length of the most fashionable sticks of this period is noticed in a number of *The London Chronicle*, published in 1762, wherein the writer says, "Do not some of us strut about with walking-sticks as long as hickory poles, or else with a yard of varnished cane scraped taper, and bound at one end with waxed thread, and the other tipped with a neat ivory-head as big as a silver penny?" Towards the close of the eighteenth century two peculiar forms of walking-sticks were commonly carried by the most gay of the young men of the period, one being a very short and strong bamboo-cane, bent over at the top, and the other a stout knotted stick, in which the grotesque natural growth of the wood was frequently regarded as its greatest excellence.

Another kind of Walking-sticks comprises those grotesque staves which have been devised or adopted by individual fancy or eccentricity. It is possible that

this peculiar humour may be of considerable antiquity, since the knotted walking-staff and wallet were the distinctive attributes of the Greek and Roman philosophers, and especially of the cynics. The chief peculiarity of this class of staves, however, consists in an ingenious adaptation of the excrescences of the wood of which they were made, into grotesque human heads and faces, of which the Exhibition contained many curious and remarkable instances. The old English form of these staves may perhaps be referred to the baubles carried by the fools and jesters who were retained by sovereigns and noblemen in the sixteenth and seventeenth centuries. The Jester's Bauble consisted of a short stout staff surmounted by the carved figure of a puppet or a fool's head; and the modern practice of carrying sticks decorated with humorous faces appears to have existed early in the eighteenth century. About 1730 *The Universal Spectator* states, that at the court end of the town, instead of swords, many polite young gentlemen "carry large oak sticks, with great heads and ugly faces carved thereon." Perhaps some of the most remarkable instances of these carved sticks ever exhibited, were those executed and carried about by James Robertson of Kincraigie, otherwise called "the daft Highland laird," of whom Kay published an etching in 1784. In the latter part of his life he adopted the amusement of carving, for which he had some talent, and sculptured in wood the effigies of such persons as attracted his wayward imagination, whether friends or enemies; the latter, however, being executed in caricature. These small figures he mounted on the upper end of a walking-stick, sometimes one above another; and as it was reported that he produced a new one every day, he was commonly accosted with the inquiry "Wha hae ye up the day, laird?" to which he would readily answer, by naming the individual and the reason for selecting him.*

It might be supposed that the Manufacture of Walking-sticks could not form a large branch of commerce, and yet a vast quantity and great variety of materials are annually consumed in it. There is scarcely a grass or a tree of sufficient elasticity or strength, which has not at times furnished the materials for a staff or a walking-stick. The stick-maker, however, gives a decided preference to some few kinds out of the almost infinite variety offered to him by nature. Amongst European woods the Blackthorn, the Crab, especially the Warted-crab, the Maple, the Ash, the Oak, especially the young or sapling oak—the Beech, the Orange-tree, the Cherry-tree, the Furze-bush, the Cork-tree, and the Spanish Reed (a grass called *Arundo donax*), are those principally used; and these woods are most generally cut towards the latter end of Autumn, especially when it is wished to preserve the bark. The West Indies furnish a copious supply of the most approved materials for walking-sticks, in Supple-jacks (vine-stems), Pimentos (from the *Eugenia pimento*, or pepper-tree), Cabbage-stalks, Orange and Lemon-tree sticks, and the Coffee-shrub and Indian briars. Numerous canes, the produce of climbing palms and gigantic grasses, are also largely used by the stick-maker. The principal of these are the following:—Ratans, Dragons, and Penang-lawyers, which are the stems of a species of *Calamus* or climbing-palm, and are obtained from India, Singapore, Java, and China—White and black

* Biographical Sketches attached to Kay's *Edinburgh Portraits*. Part I.

Bamboos, Fluted-bamboos, Whangees, Jambees,* and Doghead canes, which are the stems of various species of bambusa or grasses attaining a height of from 50 to 60 feet, and are exported from China; Ground-ratans, large Ground-ratans, Malaccas and Dragons from Singapore. There are also the Bamboo and Jungle-bamboo imported from Calcutta; and, lastly, Canes from Manilla.

It must not be supposed that these various materials, in the unwrought state, present an appearance at all resembling the finished sticks. Indeed the copious examples in the North-East Gallery (XXIX. 140) fully confirm this statement; but the truth is much more strongly impressed on the mind after an inspection of the immense warehouses of Mr. B. Meyers, who contributed them. Those repositories appear at first sight to contain stores of little value above that of fire-wood; yet many thousands of pounds have thus to be locked up for a time, in order that the various woods may become properly seasoned. It is only, indeed, after having passed about twenty times through the hand that even the commonest walking-stick assumes a saleable appearance; and the better descriptions require many more operations. The principal processes of this manufacture deserve to be described.

1. *Peeling off the Bark.*—From most of the forest-woods the bark has to be removed before the separated boughs can be made into polished sticks; but in some cases it is left on. One of the most difficult articles to manipulate is the warted crab, the excrescences of which are produced by an abnormal growth of the tree, resulting from the puncture of an insect. As a halfpenny is the payment for peeling one of the most complicated kind, it will be readily concluded that there must be some simple means of facilitating this operation; and accordingly the sticks are boiled for a couple of hours; the bark then yields to the incision of the finger-nail and may be stripped off without difficulty.

2. *Forming the Crook and Straightening the Stick.*—Few limbs of trees or even canes, are sufficiently straight in their natural condition to answer the purpose of a walking-stick, and very few present those conformations which can be readily fashioned into handles; hence the necessity for these two operations, which claim our admiration from their ingenious simplicity. The handle is formed by softening the wood or cane in hot *damp* sand, when it becomes pliable and non-elastic, and readily assumes and retains any curvature or bend that may be given to it. Minute attention, however, is required with regard to the temperature for each description of wood; hence the precise degree which is proper for each can only be learned by long experience; and in cases where a new variety of material is imported, some experimenting becomes necessary. The straightening is performed in a similar manner, excepting that the previous softening is effected in *dry* sand heated on an iron plate, that is in the ordinary sand-bath. When the stick has become sufficiently pliable, it is inserted into a deep notch cut in the edge of a strong plank, and is strained first in one direction and then in another until it has become straight. The stick when softened takes any form, much as a piece of red-hot iron would do. The straightening-plank is three inches thick, about six feet long,

* The relative fashionable value of some of these sorts of cane is satirised in *The Tatler*, No. 142, published on Tuesday, March 7, 1709-10. In that paper, "a plain dragon" is charged at five guineas, and "a true jambee" at ten.

and one foot wide, and is inclined away from the workman at an angle of about 30° from the perpendicular, it being firmly secured to the floor at the lower end.

3. *Fashioning the Stick*.—In this operation some sticks are wrought to assume a twisted or spiral form, and others the knotted appearance of a bamboo or whangee: these characteristics are imparted chiefly by rasping and filing. Heads or hoofs of various animals very commonly adorn stick-heads, and grotesque human heads frequently display proofs of considerable skill and surprising humour in the artizans employed. Examples of this latter description were exhibited in Class XXIX., No. 140; and by most of the German and Austrian Exhibitors.

4. *Staining*.—After straightening or carving, the sticks are in many instances brought to a very smooth surface by means of emery or glass-paper, and finished off with fish-skin; and they are then, previously to the varnishing, made to assume so many different hues by means of dyes, that the uninitiated would conclude that each was a perfectly distinct variety. The surface is likewise sometimes charred, and the charred portion scraped off partially here and there, so as to produce a very ornamental appearance. Sticks are also embellished with lithographic-transfers, but not in England, as hand-labour is too expensive. Malacca-canes, when not sufficiently long between the joints to form a straight stick, are made to appear continuous by reducing the larger part to correspond to the smaller, and tapering it gradually from the point of juncture. It then becomes necessary to colour that portion which has been reduced in size, and this is done with so much skill, that the stained and natural surfaces are not distinguishable.

Hitherto, mention has been chiefly made of sticks of vegetable origin. Of such as are made of animal substances may be instanced whalebone, tortoiseshell, ram's horn, rhinoceros' horn and hide, as commonly employed for sticks; and occasionally the real bone of the whale, the spine of the shark, the horn of the narwhal, and ivory. The horns of animals, under particular treatment with heat and by mechanical appliances, are drawn out into long cylinders; and tortoiseshell raspings are easily conglomerated by heat and pressure, and in the soft state formed into elongated rods applicable to the manufacture of sticks. The hide of the rhinoceros forms a very transparent horn-like substance, and is very elastic and tough. The feet of fawns, which are frequently used for stick-handles, are made to retain the required form by merely baking them. Ivory, horn, and bone, are also largely used for stick and umbrella-handles, and give, in their preparation for these purposes, employment to a considerable number of workmen.

Metals are not much used in the formation of the entire stick, but are restricted chiefly to the handles and ferrules; still, however, iron sticks painted to represent wood and cane are not unusual.

Ratan, or common canes, although used for sticks, are more frequently employed as a substitute for whalebone by milliners, stay-makers, and umbrella-makers. For the first two uses they are merely split by hand to the required size. They are also used for chair bottoms, and are then previously bleached by the vapours from burning sulphur (sulphurous acid). For umbrella-ribs the canes are first assorted into sizes by lads. They are then cut into various lengths, ranging from 10 inches to 30 inches by means of a hand-saw, a gauge-board being used to facilitate the operation. After this, three sides are removed by means of a plane,

the cane being held at one end by a vice and resting throughout its length on a plank. The ribs are subsequently dyed by boiling with logwood and copperas (sulphate of protoxide of iron), and dried thoroughly after this operation in a drying-room heated to a high temperature with a stove. Lastly, the excess of dye, a sort of crust, is removed by rubbing the ribs with a piece of waxed-cloth, by which they become polished, and they are then set straight by straining them in a cold state.

Before proceeding with the review of the contributions of the several nations, attention is claimed to the fact that London, Hamburg, Berlin, and Vienna, are the chief seats of the manufacture under consideration, and that by a curious coincidence the principal maker in three of those cities bears the name of Meyer or Meyers. Two of them, namely, those residing in London and Hamburg, are present by their works in the Great Exhibition; but the third, of Vienna, does not exhibit.

AUSTRIA.

The display of Walking-sticks in the Austrian section is very extensive, and has been contributed principally by two stick-makers; and also by a manufacturer of pipe-tubes, who has been rewarded chiefly for the latter article (see PIPES, p. 1505). Although the Two other Exhibitors have not received any Award, their contributions are deserving of favourable mention from their extent, cheapness, and goodness of workmanship. The largest exhibitor is A. TAUTZ (No. 685), who sends a very extensive collection of sticks, from 9*d.* to several pounds each. They comprise most of the known varieties, and are generally ornamented with ivory-handles, which, although not remarkable for any great correctness of form, are very well executed and very elaborate, and many of them are exceedingly humorous. Taking the amount of work into consideration, the goods of this maker are generally low in price. The Exhibitor next in importance is T. LUDWIG (No. 679), who has contributed walking-sticks from 1*s.* each, but not ranging to prices so high as those sent by the maker already mentioned. His contributions are remarkable for their cheapness wherever much hand-carving is displayed.

BELGIUM.

The Walking-sticks in the Belgium Department are contributed by One Exhibitor from Bruges (No. 416), and consisted entirely of a description ornamented with inlaying, which is well executed.

BRITISH COLONIES.

The Exhibitors of Walking-sticks from the various dependencies of Great Britain are very numerous, and their contributions highly interesting, from the variety of materials employed in their formation; none, however, can be considered in any way as representing the art of stick-making in a commercial sense. From *Western Africa* is a stick, or Staff of Honour, usually carried before the African chiefs. Besides this, which was sent by Dr. M^c WILLIAM, are several sticks from the Horn of the Rhinoceros, contributed by Mr. HANBURY, and a stained Quina walking-stick from the GROENKLOOF MISSIONARY STATION.

From *South Africa* Mr. BRIDGES has sent some sticks of Rhinoceros-hide. *British Guiana* is represented by Two Exhibitors, Mr. BEE and Mr. DUGGIN; the first of whom has sent a walking-stick made of the outer part or rind of the Tooroo palm from the River Demerara, and the second one made of a tree called Letter-wood. From the *Eastern Archipelago* are Ratans and Bamboos contributed by P. HAMMOND and Co. The *Indian Courts* contain some very interesting specimens of decorated sticks, as they do of most of the ornamental arts; they are contributed by four Exhibitors, beside the HONOURABLE EAST INDIA COMPANY. The specimens at present to be noticed consist of four bamboo walking-sticks, richly mounted in gold and silver, sent from the RAJAH of ULWAR; a stick enriched with a painted ornament, and mounted with silver, contributed by the RAJAH of KISNAGHUR; sandal-wood and carved ivory *Chowrees*, or Whisks, from the RAJAH of BHURTPORE; an Ivory walking-stick, with a gold ring; two Ivory Chowrees, one from Jodhpore, the other from Bhurtpore; and two Chowrees, made of the tail of the Yak (*Bos Grunniens*), with silver handles. There is also a selection of walking-sticks of various descriptions, made at Calcutta, and in Cochin China; Betel nut-sticks and a Sandal-wood Whisk from Calcutta. Most of these beautiful and interesting articles were purchased by the Company for the purpose of the Exhibition. The small collection from the *Island of St. Vincent* consists principally of specimens of Supple-jacks; and from *Trinidad* is a walking-stick sent by the Governor, LORD HARRIS. From *Van Diemen's Land* are two contributions of walking-sticks, made with the hard portion of the bone of the whale, with heads carved out of the whale's tooth, one being sent by Sir W. T. DENISON, and the other by Mr. T. SCREEN; and there is also a stick made of the oak of Tasmania (*Casuarina quadrivalvis*), contributed by the Venerable Archdeacon MARRIOTT.

CHINA.

In the Chinese Court is a Bamboo walking-stick, curiously carved which was contributed by Mr. F. S. CARPENTER, in addition to which may be mentioned two Chinese sceptres, one from HER MAJESTY'S CONSUL AT SHANGHAE, and a still more interesting and elaborately carved specimen contributed by Mr. P. P. THOMS, of Warwick Square, a full description of which will be found in the *Illustrated Catalogue*. It would appear from Mr. Thom's account, that it dates from 2169 years B.C. These specimens, however, must be regarded as mere curiosities, and in no way representing the commerce of China in this branch of trade, which as regards the raw material is very important, large quantities being annually exported. From Canton alone 1,200,000 sticks of various kinds were exported in 1846, consisting chiefly of different kinds of canes and bamboos, but comprising also laurel-sticks, stems of the tea-plant, and the root of the fig-tree of the Pagodas (*Ficus indica*).

FRANCE.

The French Department contains some very elegant examples of Walking-sticks, which have been sent principally by an Exhibitor noticed in the List of Awards; but specimens were also exhibited by umbrella-manufacturers, who have been spoken of in the preceding article. Indeed many of the umbrella-manufacturers of France are also makers of walking-sticks and riding-whips. France does not export a very

large quantity of walking-sticks, on account of the far less cost of production in London and Hamburg of the ordinary descriptions, and in Vienna of those with elaborately carved handles. The chief specimens sent by the French stick-makers, and also by the umbrella-makers, consist generally of articles made of elongated ram's horn and conglomerated tortoiseshell. In 1847 there were, in Paris, One hundred and sixty-five manufacturers of walking-sticks, and riding and driving-whips, employing Nine hundred and sixty-two workpeople, who produced goods valued at 140,320*l*. The journeyman, who in Paris works by the piece, earns from 2*s*. 10*d*. to 4*s*. 10*d*. per day; and a skilful engraver or enchaser about 7*s*. 3*d*. per day. The workwomen earn from 1*s*. 2*d*. to 1*s*. 10*d*. per day. M. Natalis Rondot quotes 12,000*l*. as the annual value of the productions of the largest manufacturer in Paris; but this estimate comprises also riding and driving whips. About nine-tenths of his articles are exported.

The imports of bamboo-canes into France are as follow:—

	Bamboos and Large Canes.	Ratans and other Small Canes.
	Cwts.	Cwts.
1830	146	126
1835	254	468
1840	610	1,820
1845	828	4,120
1850	950	3,606

HAMBURG.

The most important display of Walking-sticks is undoubtedly that in the Hamburg Department, contributed by H. C. MEYER, jun., who, it appears, is the most extensive stick-maker in the world. His collection contains about five hundred varieties, comprising most of the known materials. This Exhibitor, who in Hamburg employs between Two and Three hundred workpeople, has also a branch-establishment in New York. There is also a small collection from another Exhibitor of Hamburg, which, being a free port, possesses an almost equal advantage with London in regard to obtaining materials free of duty, and is generally a large purchaser at the Colonial sales in London of all the productions obtained from the British dependencies. Being placed on an equality in this respect, Hamburg has another great advantage in the cheapness of hand-labour over London, and is consequently a most powerful rival in the manufacture of sticks.

HESSE.

From the GRAND DUCHY OF HESSE is contributed a collection of sticks, ornamented with transfers from paper, printed by lithography, and which are produced at so low a price as to defy the competition of Hamburg or London. Large quantities of these very neat productions, imitative generally of sticks covered with plait, are annually exported to England and America.

PRUSSIA.

There is One Exhibitor who sends good articles from Essen.

SARDINIA.

There is One Exhibitor of beautifully finished plain sticks, which, although comprising few varieties, are very meritorious.

SWITZERLAND

sends a gold stick-head with internal mechanism.

TUSCANY.

The contributions from Tuscany consist of Five Walking-sticks, composed of numerous pieces of horn, with handles of gilt bronze.

UNITED KINGDOM.

The manufacture of sticks in England is in an increasing and most flourishing condition ; for not only are the goods for home-consumption chiefly made in this country, but Great Britain also possesses a very large export-trade in the finished article, and almost exclusively supplies the Continent with the raw material with which her markets are abundantly furnished from all parts of the world. To give some idea of the extent of the trade, it may be stated that the principal London maker prepares annually 80,000 bundles, which are equal to 2,500,000 ratans, principally for parasol and umbrella ribs ; and he also sells annually the subjoined quantities of manufactured sticks, viz :—

Partridge canes	-	-	-	-	-	-	-	-	60,000
Bamboo canes	-	-	-	-	-	-	-	-	80,000
Malacca canes	-	-	-	-	-	-	-	-	110,000
Dragon canes	-	-	-	-	-	-	-	-	100,000
Ground ratans	-	-	-	-	-	-	-	-	15,000
English sticks, such as oak, ash, crab, maple, &c.	-	-	-	-	-	-	-	-	144,000

Polished Ash-sticks are chiefly manufactured at Birmingham, where they are sawn out by machinery, and subsequently turned and polished. At present the English maker is unable to compete with the German manufacturer in producing sticks ornamented with transfers from printed papers, but probably the substitution of letterpress for lithographic printing would turn the scale in favour of England.

The importation of walking-sticks is, however, very small, as will be seen from the following table :—

Value of the IMPORTS into the UNITED KINGDOM, of Manufactured Walking-sticks in 1850.

									£.
From the Hanseatic Towns	-	-	-	-	-	-	-	-	792
„ Holland	-	-	-	-	-	-	-	-	450
„ France	-	-	-	-	-	-	-	-	269
„ Other Parts	-	-	-	-	-	-	-	-	93
From all Parts	-	-	-	-	-	-	-	-	<u>1,604</u>

Whalebone-sticks are made better and cheaper in Germany, and the continental makers are also more proficient in making sticks from the hide of the rhinoceros ;

but as regards those ornamented with silver wire, England is unrivalled, and holds a high position with regard to the chased silver and gilt handles; indeed the ferrules and metal-work generally are unsurpassed. The same remark which was made with respect to umbrella-, here applies to the carved ivory stick-handles: the fault appears to consist in choosing subjects which cannot be well executed at such prices as can be afforded for the carving.

The following wholesale prices will give some idea of the value of the different kind of Sticks of British manufacture, though not a very accurate one, without at the same time seeing the samples:—

Polished Ash sticks-	-	3s.	per doz. to	6s. per doz.
Bamboos	- - -	2s. 6d.	„ to	6s. „
Partridge	- - -	6s.	„ to	18s. „
Whangee	- - -	4s.	„ to	48s. „
Malacca	- - -	4s.	„ to	40s. each.
Beech, with crutch handles,	12s.	„	to	18s. per doz.
Canes, with loaded heads	10s.	„		
Sword-sticks	- - -	7s. 6d.	„ to	12s. each.

Walking-sticks are sent by Thirteen Exhibitors, whose productions are dispersed in various divisions, as, for example, in Classes VIII., X., XVI., XXII., and XXIX. These specimens comprise many instances of the employment of walking-sticks for containing various implements, alluded to in the introductory matter. Beside the instances there quoted, are to be found—a walking-stick which serves the purpose of a miniature wine-cellar and larder (Class XVI., No. 81); one which contains a voltaic-battery (Class X., No. 423), which continually subjects the owner to an electric current; one (Class XXIX., No. 183) to contain guide-maps, and two or three others convertible into seats, umbrellas, and other instruments.

UNITED STATES.

The United States are represented by One Contributor, who exhibits a gold-headed walking-stick, made from the Curled-hickory.

WURTEMBERG.

Beside One manufacturer, who exhibits sticks to some extent, Three Contributors send stick- and umbrella-handles, with other articles in ivory, one of whom has obtained a Prize Medal, to be alluded to under the article Toys.

Beside those who exhibit walking-sticks, with articles discussed in other portions of this Report, there are Forty-six Exhibitors of Walking-sticks only, or principally; of these, there are:—

5	Holder	of a Prize Medal.
3	Who	obtained Honourable Mention.
38	Unrewarded.	
46	Total.	

The number of Exhibitors from the various countries is as follows :—

Austria - - - - -	2	France - - - - -	1
Belgium - - - - -	1	Hamburg - - - - -	2
British Colonies :—		Hesse - - - - -	1
Guiana - - - - -	2	Prussia - - - - -	1
Eastern Archipelago - - -	1	Sardinia - - - - -	1
East Indies - - - - -	5	Switzerland - - - -	1
South Africa - - - - -	1	Tuscany - - - - -	1
St. Vincent - - - - -	1	United Kingdom - - -	13
Trinidad - - - - -	1	United States - - - -	1
Van Diemen's Land - - -	3	Wurtemberg - - - - -	1
Western Africa - - - - -	3		
China - - - - -	3	Total - - - - -	46

LIST OF AWARDS.

BAGRÉ, — (France, No. 1123). Honourable Mention is accorded for a collection of Walking-sticks made of Ram's-horn and Tortoiseshell.

CIAUDO, JOSEPH (Sardinia, No. 68). Prize Medal, for a collection of well-manufactured Walking-sticks, comprising several varieties of wood.

FRANK, J. G., Offenbach (Grand Duchy of Hesse, No. 61). Honourable Mention is accorded for a large collection of well-made and very cheap Walking-canes, which are ornamented with tartan and other patterns, transferred from lithographic impressions on paper, and then highly varnished ; and also for papier-maché Snuff-boxes.

HEDINGER, C., Stuttgart (Wurtemberg, No. 92). Prize Medal, for a collection of Malacca walking-sticks, Partridge walking-canes, Umbrella- and Parasol-sticks, and some few Umbrella-frames. The goods exhibited are well made, and at very reasonable prices.

MEYER, H. C., jun. (Hamburg, No. 86). Prize Medal, for a most extensive assortment of excellent Walking-sticks, Sword-sticks, and Dart-sticks, the mounts of which are, in most cases, tastefully designed and well executed. The collection comprises also Split-whalebone, plain and fluted, which is used for covering sticks, whips, opera-glasses, and telescopes.

MEYERS, BARNETT, 18 Crutched Friars (Class XXIX., No. 140). Prize Medal, for a very large and interesting collection of canes and sticks of various descriptions, in the raw state, which comprises all the principal varieties. Also Parasol and Umbrella-ribs of dyed ratan ; Cane-ribs for milliners, cap-makers, whip-makers, and chair-makers, together with an excellent collection of highly-finished Walking-canes, Sword-sticks, and Dart-sticks, the mounts of which are good in design, and of the best class of workmanship.

SCHULZ, C., Essen (Prussia, No. 593). Prize Medal, for a collection of well-made Walking-sticks and Sword-canes, which are well manufactured, and are sold at reasonable prices.

TONTI, L., Florence (Tuscany, No. 102). Honourable Mention, for a collection of Walking-canes composed of numerous pieces of horn of different tints.

IV.—FANS.

Upwards of 3,000 years ago the artist of ancient Egypt painted the fan on the walls of the tombs at Thebes. There the Pharoah sits surrounded by his fan-bearers, each in his due rank ; and there is seen an investiture of a fan-bearer, which realizes the description in *Genesis* of the honours paid by Pharoah to Joseph. The office of fan-bearer must have been honourable ; and the insignia of office were long, slender, vividly-coloured fans on variegated or twisted handles : in war the same officers acted as generals or marshals, using their fans as standards ; and in peace they assisted the Pharoah in the temple, and waved their variegated fans both to produce a cooling breeze, and to guard the sacred offerings from the contamination of noxious insects.

The Fan is mentioned by Euripides, and its origin from “barbarous countries ;” its use in Greece was similar to that in Egypt, but its forms were far more beautiful. The wings of a bird joined laterally and attached to a slender handle formed the simple yet graceful fan of the Priest of Isis, when Isis became a Grecian deity ; but it had not this form alone, for the Greek vases of Sir W. Hamilton show that feathers of different lengths were taken and spread out somewhat in the form of a semicircle, but pointed at the top ; a thread connected the feathers at their base, and another near their summit, and the fan thus made was fixed in a handle. This fan, the precise type of the State-fan of India and China of the present day, was waved by a female slave.

The Fan, according to Virgil and Apuleius, was sacred to Bacchus, and the “*mystica Vannus Iacchi*” was carried in procession in the feast of that deity, as well as in the Eleusinian Mysteries. Its appellations multiplied, though its office remained the same, and it was termed indifferently “*Flabellum*” or “*Muscarium*.”

The modern Greek church is careful to place a fan in the hands of its deacons, to guard the officiating priest and the elements from desecration.

The Roman ladies certainly enjoyed the luxury of the fan, which, gorgeous with peacock’s feathers, or delicate with the tinted plumes of the ostrich, could not yet be folded, and rendered the services of an attendant necessary.

In the works of the middle ages references are made to the two forms of the fan, to that employed for winnowing the grain, and that used in the service of the church, alternately to court the breeze or wave away the flies, till we hear of the fan as brought to France by Catherine De Medicis, when it was no longer stiff and unyielding, but light and pliable. In the early part of the seventeenth century, it was so constructed that it could be folded in the manner of those used in the present day. Formed of paper and perfumed leather, it became the delight of the French court ; and, attracting the attention of artists, Fans in the luxurious reigns of Louis XIV. and Louis XV. (in the latter under the name of “Pompadours”), shone with gilding and gems, and at length glowed with the pictures of Boucher and Watteau ; until at length no toilet was esteemed complete without a fan, the cost of which was frequently in those days as high as from 12*l.* to 15*l.* sterling. In Italy, on the contrary, in the early part of the seventeenth century, even painted Fans were of a very moderate price, and of universal use. “The first Fans,” says Coryat, in his *Travels* in 1608, “that I saw in Italy, I did observe in this space between Pizighiton and Cremona ; but afterwards I observed them common in most places

where I travelled. These Fans both men and women of the country do carry to cool themselves with in the time of heat by often fanning of their faces. Most of them are very elegant and pretty things. For whereas the frame consisteth of a painted piece of paper and a little wooden handle, the paper which is fastened into the tops is on both sides most curiously adorned with excellent pictures, either of amorous things, having some witty Italian verses or fine emblems written under them; or of some notable Italian city, with a brief description thereof added thereto. These Fans are of a mean price, for a man may buy one of the fairest of them for so much money as countervailleth an English groat."

England must have been a great buyer of fans in the last century, as a lady of that period would have felt as awkward without her fan as a gentleman without his sword. Indeed Addison makes the comparison, and in the *Spectator* he describes an academy where the use of the fan is taught. "In the flutter of a fan," he observes, "there is the angry flutter, the modest flutter, the timorous flutter, the confused flutter, the merry flutter, and the amorous flutter." He says, "I have seen a fan so very angry that it would have been dangerous for the absent lover who provoked it to have come within the wind of it."

Gay, again, gives the Fan as a present from Venus to a despairing lover, in order to soften his mistress, and describes in verse the hint which the peacock's tail presents for its construction.

CHINA.

In Fan-making the Chinese and French are the great rivals, and may be said to monopolize the supply of the whole world. In the lacquered fans the superiority of the natives of China is fully admitted; they are unrivalled, especially when price is taken into consideration, in the sculpturing and piercing of the wood, bone, ivory, or mother-of-pearl framework. Even their commonest fans are remarkable for boldness and originality of design, brilliancy of colouring, sharpness of drawing, and solidity and correctness of workmanship. The manufacture of fans is carried on almost exclusively at Canton, Sou-tchou, Hang-tchou, and Nankin. The fans of ivory and bone and of feathers, are made exclusively for exportation to Europe or America; those used by the Chinese are of bamboo polished or japanned, and covered with paper: they are sold at from 10*d.* to 14*s.* 6*d.* per dozen, according to the quality of the frame and the design of the leaf.* The examples which are in the Great Exhibition did not, however, come direct from any Chinese maker, but were contributed by Three English Exhibitors, viz.: MESSRS. C. T. BRAINE, J. DANIELL, and HEWETT and Co. The examples exhibited comprise Fans of painted and embroidered Feathers; a Feather-fan painted with silver outlines, representing groups of Chinese figures, the feathers being alternately blue and white; an Ivory-fan elaborately carved and pierced, and, considering the amount of work, very cheap, its price being only 20*s.* There are also several very common Paper-fans, ornamented either with rude delineations of landscapes, or besprinkled with gold-spangle.

* *Étude pratique du Commerce d'Exportation de la Chine*, by Natalis Rondot, pp. 92, 93.

FRANCE.

Fan-making has arrived at a high degree of perfection in France, and presents a remarkable instance of the subdivision of labour, as may be gleaned from the statement, that about twenty different operations, performed by as many pairs of hands, are necessary to the production of a fan which sells for less than one halfpenny; and that these various processes are not all carried on in a single manufactory, but, on the contrary, form four distinct branches of trade, directed by masters employing the various artisans, who, for the most part, work at their own homes, and who are frequently assisted by their wives and children.

A Fan consists of the frame of solid material, called a "*Pied*," which is composed of the inner ribs or "*Brins*," and the two outer ribs or "*Panaches*," and likewise of the flexible leaf or "*Feuille*." The frame is made of wood, bone, ivory, tortoiseshell, or mother-of-pearl. The first operation is performed by sawing the material into the required form for the inner and outer ribs. These ribs then pass into the hands of another workman, who shapes them with a file, and they are then taken up successively by the polisher, the piercer, the sculptor, the gilder, and the workman who fixes on them the spangles and pins of gold, silver, and steel. The frame is now sent to the manufactory which furnishes the necessary drawings for the series of operations, where it is riveted, the rivet being frequently ornamented with a precious stone.

The Leaf or *Feuille* is sometimes single, but more often double; and it is usually made of paper lined with silk or calico, but also of parchment, lamb's skin, satin, and silk gauze. The richer kinds of *feuilles* are painted in water-colours on vellum, by artists known as *feueillistes*; and the highest and most expensive class by artists of celebrity, since Boucher and Watteau, Camille Roqueplan, Gavarni, Clément Boulanger, and Dupré have affixed their signatures to fans which they have decorated. The devices on the more ordinary descriptions of fans are printed from copper plates, and coloured by hand, and the most common sorts are ornamented by the process of chromo-lithography.

The *Feuille* is folded in a mould of strong paper, and is then mounted on the frame and glued to the prolongations or "*Bouts*" of the inner ribs. The *feuille* of the best fans is after this painted on the edge with gold-size, and gilt with leaf-gold; but the *feuille* of the common fans is printed in Dutch-metal, previous to its being cemented on the frame. The decorator now ornaments the frame with gold or coloured ornaments, and the fan lastly passes into the hands of the overlooker, who attaches the tassels, and selects the proper-sized sheath into which she places it.

The Frame or "*Pied*" is made in the parishes of Andeville, the Deluge, the Boisière, Corbeil-Cerf, and Sainte Geneviève. In the district situated between Méru and Beauvais, in the Department of the Oise, 2,000 workpeople, men, women, and children, are employed in the fan-trade. The woods used are the beam-tree, the plum-tree, ebony, sandal, and the lime-tree. The dexterity and sureness of hand of the peasant-workman are said to be quite wonderful. Considering his want of knowledge of the principles of drawing, his facility in engraving, sculpturing, and gilding is certainly remarkable. The piercing is performed by means of minute saws, which the workman makes for himself with

pieces of watch-spring. A remarkable piece of saw-piercing in the shape of a mother-of-pearl fan is exhibited in the French Section, No. 149; it contains no less than 1,600 holes in the square inch: this tour-de-force is the production of one of these peasant-artisans, named Désiré Fleury.

The printing, the colouring, and the mounting of the Feuille, and the final embellishment of the Fan, are usually performed at Paris, under the direction of the Fan-maker, called *par excellence* "*Eventailliste*;" though he has really but little to do with the manufacture of the fan, and must be regarded rather as the collector into one focus, and arranger of the produce of others; yet his labours are not the less essential. The mounting of the feuille, its ornamentation with feathers, and final decoration are the operations usually performed by a small number of work-people in his own establishment: besides which he furnishes the drawings to the peasant in the Oise for the framework to suit the constant changes in fashion; he instructs his feulliste as to the style of ornament; he groups together the frames and feuilles; and finally he overlooks the whole to see that the workmanship has been well executed. Except the mountings of the feuille and the final adorning of the fan, the other operations are usually performed by workmen at their own homes. The number of fan-makers or *Eventaillistes* in Paris, in 1827, was 15, who employed 1,010 workmen (344 men, 500 women, and 166 children); and sold about 40,420*l.* worth of Fans. According to the *Statistique sur l'Industrie à Paris*," drawn up by our colleague, M. Natalis Rondot and M. Say, it appears that in 1847, there were 122 Fan-makers, comprising chamber-masters as Mounters, Feuillistes, Painters, and Colourers. The value of the fans made was 110,000*l.* These masters employed 575 workpeople (262 men, 264 women, 29 youths, and 20 girls). The workmen on the average earned 3*s.*, and the women 1*s.* 8*d.* per day. The men were for the most part copper-plate engravers and printers, lithographic draughtsmen and printers, painters, and colourers; the women were mounters, illuminators, painters, colourers, and overlookers. Thus in twenty years, it appears that the produce in fans had increased in value nearly threefold, whilst the number of workpeople had diminished to one-half. This change is to be attributed to the employment of machinery; especially of the fly-press in stamping out and embossing the ribs, and the extensive employment of chromo-lithography, an art not practised at the former period. By these means the French have been enabled greatly to increase their exports by the production of cheap fans, to compete with those made by the Chinese. P. DUVELLEROY exhibited some small fans, the price of which was as low as 5*d.* per dozen.

The collection of Fans in the French Department is most complete, and contains several specially decorated in honour of the Exhibition, and of Her Majesty and Prince Albert. Beside these and others, painted by first-rate artists, it comprises most of the descriptions manufactured for exportation, and which possess distinctive characters, according to the market for which they are destined. For instance, some display great differences in the length of the ribs and the portion of the circle occupied by the fans when open: other fans, intended for Turkey and Morocco, are composed entirely of feathers, and, in conformity with the Mohamadan doctrines, no living object is painted on them. The principal foreign markets for fans made in France are the South American States. In the decoration of such fans as are intended for Buenos Ayres, blue and green are

carefully omitted, these colours having political significance, and being prohibited from use on pain of death. All the Exhibitors are of the class called "*Eventaillistes*," as none of the manufacturers of the Department of l'Oise send their productions.

BRITISH COLONIES.

The colonial dependencies of Great Britain contribute many examples of Fans, some of which are interesting on account of their simplicity, whilst, on the other hand, those from India present most striking proofs of the luxurious splendour of the Indian princes. *British Guiana*. Mr. W. H. HOLMES exhibits fans made of the Ita-palm. *Canada*. A fan of somewhat similar nature, but made of the bark of a tree, is contributed by Miss HELEN ROCHELEAU. *Ceylon*. There are several rich "Punkahs" or fans, and a richly painted ivory fan-handle from this island. *India*. The Indian Department contains Fans or *Punkahs* in great variety as regards form, decoration, and the material employed, some of them being of a very costly description. There are, for example, two fans contributed by H. H. the RAJAH of KOTA, one with an ivory handle, the other with a gold handle: but as the names of the various manufacturers were unfortunately not ascertainable at the time the Jury examined these specimens, no prizes were awarded in their favour. The Indian Fan differs from that of Europe and China in not closing, and likewise in its form; and it is usually kept in motion by an attendant. Beside the fans affixed to central handles, all of which are most gorgeously enriched with embroidery and jewels, there are exhibited others resembling a curtain suspended from a silver rod, which is held horizontally by the attendant, and waved backwards and forwards over the head of the wealthy Hindoo: and there is also the circular Standard-fan; the handle being a silver staff, crooked at the top, to which the fan is attached, on the side opposite to the crook. The attendant stands by the side of his master, and placing the end of the staff against his foot, inclines it away from his body and slowly swings it to and fro. There is also a beautiful Peacock-feather Fan from Assam, and a Fan or *Punkah*, composed of China beads and pearls, and made in the city of Delhi. The most simple, however, are those made of the entire or the divided leaf of the *Borassus flabelliformis*, manufactured at Calcutta and commonly used both by natives and Europeans. The other examples comprise, a Punkah made of Khus-Khus grass (*Andropogon muricatus*) which, when wetted, emits a fragrant perfume; Fans made of sandal-wood, from Calcutta; a Fan made of bamboo from Moorsshedabad, and several of similar description from other parts of India; and lastly, from Bengal, large and hand-fans, made of the Palmyra-leaf. As far as the Reporters could ascertain the names of the contributors, it appears that, besides the fans from the Rajah of Kota, before named, several of the examples were sent by the RAJAH of PATTIALA, the RAJAH of JODHPORE, the JUBBULPORE SCHOOL OF INDUSTRY, and CAPTAIN DALTON. The inspection of these beautiful productions of Indian workmen, naturally suggests the idea that their skill and remarkable taste might be turned to profitable account, if directed to the production of fans suitable to the European and American markets. *Nova Scotia* sends an example of a very simple Indian fan. *Trinidad*. LORD HARRIS, the Governor, sends examples of fans for ladies. And

from *Western Africa*, Mr. R. JAMESON, of Liverpool, exhibits several fans from the banks of the Niger, one of which is made of a species of grass.

EGYPT.

A few specimens of Fans are exhibited in the collection from Egypt, to which much interest attaches, as coming from a country in which, possibly, the Fan was first devised.

SPAIN.

There are Two Exhibitors of Fans in the Spanish Court, one of whom contributes Painted and also Printed "*Feuilles*;" and the other both Feuilles and complete Fans, some of which are copies from French models. The examples, although they will bear no comparison in point of taste or execution with the splendid Fans from France, are good of their kind; and it would appear that the attention of their Exhibitors has been directed rather to the manufacture of an article for general sale, than to the production of works of art. But it is remarkable, that no finer specimens should have been sent from a country in which the use of fans is so prevalent that they are commonly offered for sale outside the arena of the Bull-fights and other places of amusement.

TUNIS.

The Fans in the Tunisian Court are Ten in number, and are in some cases ornamented with rich embroidery.

TURKEY.

The only example is an embroidered Fan made at Adrianople.

WURTEMBERG.

Several Bone-and-Ivory fans are exhibited by M. C. STOLL of Ulm; they are reasonable in price, but not nearly so good as the Ivory-fans contributed by the French makers.

The number of Exhibitors of Fans is Twenty-three ; of these, there are :—

2	Holders of a Prize Medal.
1	Who obtained Honourable Mention.
20	Unrewarded.
23	Total.

The number from the various countries is as follows:—

British Colonies :—						China	-	-	-	-	-	3
British Guiana	-	-	1	} 11		Egypt	-	-	-	-	-	1
Canada	-	-	1			France	-	-	-	-	-	3
Ceylon	-	-	1			Spain	-	-	-	-	-	2
India	-	-	5			Tunis	-	-	-	-	-	1
Nova Scotia	-	-	1			Turkey	-	-	-	-	-	1
Trinidad	-	-	1			Wurtemberg	-	-	-	-	-	1
Western Africa	-	-	1			Total	-	-	-	-	-	23

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LIST OF AWARDS.

DUCROT and PETIT, Paris (France No. 149). Honourable Mention, for a collection of Fans in ordinary demand and at reasonable prices, namely, from 5*d.* to 40*s.* each; also excellent examples of pierced and sculptured ivory and mother-of-pearl fans, one of the specimens of which has been before alluded to in the introductory notice. These are of much higher quality, and range in price from 3*l.* to 12*l.* each.

DUVELLEROY, P., Paris (France No. 495). Prize Medal, for a display of Fans ornamented with artistic paintings, and remarkable for the beauty of the inlaying, and the pierced ivory and mother-of-pearl frames. The most elegant fan in this collection is one painted by Roqueplan; the ribs are of richly-pierced and sculptured mother-of-pearl inlaid with gold; it is valued at 40*l.* Beside the above, others intended for foreign markets were exhibited, the prices of which vary from 5*d.* to 40*s.* per dozen.

FÉLIX, ALEXANDRE, Paris (France No. 199). Prize Medal, for a collection of Fans, being for the most part copies of the best examples of ancient fans: these, although not possessing the merit of originality, are such remarkably beautiful specimens of vellum-painting, that they fully entitle this manufacturer to the Award, and are moreover the richest of any exhibited.

V.—PIPES AND AMBER-MANUFACTURES.

Before discussing the merits of the Pipes contributed from all quarters of the globe to adorn the Great Exhibition, it will be proper to notice the materials principally employed in their manufacture.

Clays, of different kinds, are more used than any other substance in the formation of pipes: but as their nature and composition will probably be fully discussed in the Special Report on the Fictile Arts of which Clay pipe-making is comparatively but a small branch, it is needless here to describe them.

Woods of several descriptions are next in importance. The wild cherry-tree, and the jasmine are the principal sorts, and great care is bestowed on their culture to insure their growing free from knots and blemishes; the young stems of the jasmine being wound round with cloths to effect that object. Lemon-tree and ebony are also in request, the latter being generally used for carved tubes.

Mother-of-pearl, *Horn*, *Ivory*, and *Bone* are extensively used; nor are the *precious metals* and costly *jems* excluded from a share in the formation of the pipe. But these have not that intimate connection with the subject under notice, which appertains to two materials—*Meerschaum* and *Amber*, whose names are euphonious to the ear of the genuine smoker. The former substance is devoted exclusively to his use; and the latter, though not entirely his own, pays to him a very considerable tribute in the form of mouth-pieces.

So early as the year 1609, the genuine Meerschaum must have been held in estimation in England; since Dekker appears to refer to it in his "*Gull's Horn-book*," when he wishes his gallant to be able to discourse "which pipe has the best bore, and *which burns black*, and which breaks in the burning."

MEERSCHAUM (*Écume de mer*) is a mineral of somewhat rare occurrence. It consists of magnesia, silica, and water, and may be called a hydrated silicate of magnesia (MgO , $\text{SiO}_3 + \text{HO}$). As the compound is not crystalline, its constituents

are variable, and thus silicates of iron and alumina are often found in combination with it. These affect the colour of the Meerschaum, which when pure is quite white. Silicate of iron frequently occurs, and gives it a tinge of colour, varying from the palest yellow to a deep brown. Good Meerschaum is tolerably soft, it resists the pressure of the hand, but is easily indented by the finger-nail, and, especially after having been wetted, may be easily cut with a knife. The fracture is generally earthy, and rarely conchoidal; still the state of aggregation of even pure meerschaum is very variable, as is proved by the marked differences in its specific gravity. Some kinds sink in water, others float on its surface: these qualities in the estimation of the pipe-maker are indicative of different values, for he rejects both the very heavy and the very light, and prefers those of medium density. The light varieties are generally very porous, and even contain large cavities, whilst the heavier kinds, he suspects to be an artificial product.

Meerschaum is met with in various localities in Spain, Greece, and Moravia; but by far the largest quantity is derived from Asia Minor, it being dug chiefly in the peninsula of Natolia, near the town of Coniah. Formerly the material was roughly fashioned on the spot into bowls, which were more elegantly carved in Europe. The art was especially cultivated in Pesth and Vienna, where it formed an extensive and important branch of trade. These rough bowls still occur in commerce, but by far the greater part of the meerschaum is exported in the shape of irregular blocks with obtuse angles and edges, requiring careful manipulation with the aid of water, in order to remove irregularities and faulty portions. (A beautiful specimen of meerschaum thus cleaned is contributed by LUDWIG HARTMANN, Austria, No. 675; there is also a box of meerschaum earth in the Grecian Department, No. 23.) This preliminary treatment still leaves numerous blemishes, and the meerschaum of commerce has defects of various kinds; besides various minerals scattered through its mass, it contains a hard sort of meerschaum, which the manufacturer calls chalk (*Kreidemassen*), and which is the cause of much difficulty in the carving.

Previous to the mechanical treatment of the meerschaum* for making the bowl, it is subjected to a certain preparation. It is soaked in a liquified unguent composed of wax oil, and fats. The wax and fats which the substance absorbs cause the colours which meerschaum assumes after smoking. Under the influence of the heat produced by the burning tobacco, the wax and fats pass through all the stages of a true process of dry distillation; the substances thus formed become associated with the products of the distillation of the tobacco, and by their diffusion through the meerschaum, all those gradations of colour which are so highly prized by the connoisseur are produced.

Occasionally, though rarely, the bowls are artificially stained by dipping them, before they are soaked in wax, in a solution of copperas (sulphate of iron), either alone or mixed with one of dragon's blood. This process must manifestly affect, very materially, the shades of colour produced in smoking.

Attempts have not been wanting to imitate meerschaum, the process being rather mechanical than chemical; for although chemists have of late been very

* This subject is ably discussed under the head "Meerschaum," in Precht's "*Encyclopädie der Gewerbe und Künste*," from which some of the foregoing remarks have been abstracted.

successful in the artificial production of minerals, for instance, palagonite (Bunsen), spinelle (Ebelmen), crystallized carbonates (Senarmont), no one has attempted the production of meerschaum, chemically.

The large quantity of meerschaum parings that are left in roughing-out the bowls would entail considerable loss, unless some process had been devised of rendering them available. A species of meerschaum-bowls has long been known in commerce under the name of *Massa-köpfe* (massa bowls), which is made from the parings; these are triturated to a fine powder, boiled in water, and moulded into blocks with or without the addition of clay: each of these blocks suffices for one bowl; but before they can be used they must be allowed to dry for some time, as they contract considerably. Specimens of composition pipe-bowls and cigar-tubes are exhibited in the Austrian Section, No. 687. These bowls are distinguished from real meerschaum by their greater specific gravity; but there is no very certain test by which the real meerschaum can be distinguished from the composition, and many suppose that all the heavier descriptions are spurious, though there is no absolute proof of this being the case. A negative test may however be mentioned; the composition bowls never exhibit those little blemishes which result from the presence of foreign bodies in the natural meerschaum, therefore if a blemish occur in a meerschaum bowl, which is very frequently the case, the genuineness of the bowl is rendered most probable; but as these do not show until after the bowl has been used for some time, the test is not of much value.

Amber.—The most extensive use of this elegant material is for the manufacture of the mouth-piece, an essential constituent of the genuine meerschaum and Turkish pipe. Up to the present day, amber mouth-pieces continue in great request in the East, where they fetch very high prices, instances of which will be quoted. There is a current belief in Turkey that amber is incapable of transmitting infection; and as it is a great mark of politeness to offer the pipe to a stranger, this supposed negative property of the amber accounts in some measure for the estimation in which it is held. In the Christian countries of Europe, ivory, bone, and horn, have to some extent usurped the place of the more costly material, which is reserved for the higher class of pipes. Amber is also much employed in numerous small fancy articles, especially for beads, necklaces, brooches, and earrings. The Exhibition furnishes also examples of its being worked occasionally into candlesticks, salvers, pipe-tubes, and other larger articles. The coarser descriptions and chips of amber are also employed for the manufacture of varnish, and the preparation of amber-oil and succinic acid, which it yields by distillation at a moderate temperature. Copal, which bears a strong resemblance to, but is much cheaper than amber, is occasionally substituted for it, fraudulently or through ignorance. There is no difficulty in distinguishing the two by a chemical analysis, but this renders the sacrifice of a small piece of the substance necessary; some varieties of amber, especially the dark yellow and transparent descriptions, are scarcely to be distinguished, unless by a well-practised eye, from copal. A few words may be said respecting the chemical characters of amber which, however, do not affect its employment in manufactures. According to an analysis of Berzelius, it contains a volatile oil, succinic acid, two resins soluble in alcohol and ether, and a complex bituminous substance (succinic bitumen) which is not affected by any solvent.

The mode of obtaining amber is peculiarly interesting. The greater part is

found on the coast of Prussia Proper, especially between Königsberg and Dantzic; it is distinguished as terrestrial and marine amber; the former is dug in mines, and is generally found in alluvial deposits of sand and clay, associated with fossil wood, iron pyrites, and alum-shale. Amber is also found in some other countries, but never to any amount. The marine amber is cast ashore during the autumnal storms on the coast of Pomerania and Prussia Proper. It is then picked up, or fished for with small nets. There are several fine specimens of both descriptions of amber in the Austrian Section, No. 675, and in the Prussian Section, Nos. 438, 439, 440, and 441. In the case bearing the latter number are specimens of land amber, and the fossil wood associated with it which were obtained at a depth of 60 feet by the Exhibitor, M. TESSLER, who employs about 20 workpeople in his amber-pits. The opinions respecting the origin of amber are very divided, some hold the view expressed by Tacitus in his *Germania*, that it is a resin exuded by certain coniferæ, traces of which are frequently observed among the amber. Others assume it to be a species of wax or fat, having undergone a slow process of putrefaction; and they base their views upon the fact that chemists are able to convert cerous or fatty substances into succinic acid by inducing oxidation artificially. It is quite certain that at one time amber must have been liquid, for numerous small animals are found enclosed within it; these for the most part are insects belonging to an extinct species of *Arachnida*. There are numerous and excellent specimens of amber enclosing insects in the Prussian Section, No. 441, and others in a case which deserves favourable mention from D. T. TESSLER, who has sent one specimen containing the leg of a toad.* The processes which nature employs for the preservation of the structure of extinct insects, is one which the microscopist successfully imitates by embalming his delicate dissections in Canada balsam between two slips of glass.

There is evidence of the extreme antiquity of amber in the fact that the Phœnicians of old fetched it from Prussia. Since that period it has been obtained there uninterruptedly, and no diminution in the quantity annually collected has been perceived. This would almost induce a belief in the correctness of the putrefaction theory, above alluded to, and we may perhaps assume that a constantly new formation of amber is taking place. This view is somewhat strengthened by the different appearance of the varieties of amber, which seem to exhibit the successive stages of its development and decay: still this conclusion to many will appear strained. The different kinds of amber are distinguished by varieties of colour and degrees of transparency. It is found of all shades of yellow, from the palest primrose to the deepest orange, or even brown. In point of clearness amber varies from vitreous transparency to perfect opacity, specimens being obtained nearly as white as ivory; in this latter case the transformation is assumed to have advanced farther than in the ordinary varieties. It is rarely found, and is chiefly used for cameo-ornaments, and is mounted on darker amber which forms the background. Several examples of its employment are exhibited in the Prussian Section.

An inquiry naturally suggests itself as to which of these varieties of amber is the most valuable. It is self-evident that this must depend, as in the diamond,

* According to M. Natalis Rondot, specimens of amber containing insects are of frequent occurrence in China.

upon the size and the uniformity of the pieces. Besides, as all the varieties, excepting the white which has its special uses, are equally applicable for manufacturing purposes, it follows that the value of any particular sort must depend in a great measure upon its rarity. The straw-yellow, slightly cloudy, translucent variety is the most rare, and is that which the Orientals prefer to all others, and which they purchase at extravagant prices. There are few specimens of it in the Exhibition, and it is needless to search for them in the German Department, as every piece that is found in Prussia is exported to Turkey in the raw or manufactured state; and it is in the Section occupied by this latter country (Nos. 1928, 1929) that the only specimens in the Exhibition will be found.

Some writers are of opinion that the preference which the Orientals show for the pale-yellow, slightly clouded variety, has been transmitted to them from the ancients, but their arguments will not bear a close examination.

Having alluded to this matter, it will be as well to advert to the opinions held on the subject by the ancient authors. It appears that the word "electron" (amber) had two significations; one referred to the substance which we call amber, hence the derivation of the word electricity, from its long-known property of attracting, when rubbed, light substances, such as straws, which was the first electric phenomenon ever observed; the other meaning applied to an alloy of gold and silver found in nature, or produced artificially. Pliny* expresses himself very clearly on this point; he says that gold always contains silver, and that when the silver amounts to one-fifth of the compound it is termed "*electrum*;" if the proportion is higher, the *electrum* ceases to be malleable.

It has been assumed that the latter was the original meaning of the term, and that it was subsequently applied to amber on account of its resemblance to the white gold, the variety most closely resembling the alloy possessing the highest value. This view is supported by the circumstance that we find "electron" spoken of by the epic poets Hesiod and Homer as employed in articles for which amber would scarcely be applicable. The application, for instance, of amber for shields might cause some alarm for the safety of the Homeric heroes. But the ancient poets did not always pay minute attention to the natural qualities of the materials which they mentioned in their narrative: this is evident from Hesiod employing other fragile substances, such as ivory and alabaster in the manufacture of shields. Moreover, the fine carving of these show-pieces was not adapted to resist heavy blows. The learned Buttmann (*Abhandlungen der Berliner Academie*, 1818, 1819) very correctly observes that these works of art are derived by the poet direct from the workshop of Vulcan, and that this at once does away with any protest against the insecurity of ivory, alabaster, or enamel in the manufacture of his shields. The same learned antiquary has compared critically the most important passages in which the word "electron" occurs, and he has demonstrated, incontrovertibly, that the word originally meant amber, and that the second interpretation has only been introduced at a later period, especially by the tragic poets. Thus it

* *Historia Naturalis*, xxxiii., c. 4. Omni auro inest argentum vario pondere, alibi dena, alibi nona, alibi octava parte. Ubicunque quinta argenti portio est, electrum vocatur. Fit et cura electrum argento addito; quod si quintam partionem excessit, incudibus non resistit. Et electro auctoritas Homero teste, qui Menelai regiam auro, electro, argento, ebori fulgere tradit.

Id. Page 469, vol. ii., of Holland's Translation.

follows that the transmission of the predilection for the straw-coloured cloudy amber from the ancients is far from being proved, and that we must content ourselves with the explanation first attempted, of its resulting from the greater rarity of this kind of amber. This predilection appears to be confined to the East, as in other countries, *e. g.*, Russia, the orange-yellow transparent variety is decidedly preferred, possibly on account of its cheapness. The Russian peasant girls adorn themselves with double and treble rows of amber-beads; though frequently they are supplied with mere copal-beads instead of the genuine article.

Having made these general observations on the character of amber, we pass to the detailed consideration of what has been presented to us in the Exhibition under the head of Pipes and Amber-Manufactures.

GERMANY.

No one will be surprised that this land of smokers bears off the palm in the manufacture of pipes and amber; nor that her Exhibitors outnumber those of all other nations collectively. All the States of Germany, however, have not contributed equally, the pipes being chiefly from Austria, and especially from Vienna, and the amber-manufactures from Prussia. The meerschaum works of the Viennese are unrivalled, as regards taste in design and excellence in execution; the carving of many of the pipe-bowls and cigar-tubes being examples of highly cultivated art. Most of the fancy pipe-tubes, composed of horn and mother-of-pearl, are more curious than graceful; the cherry-tree-tubes are in great variety, and are good examples of this component of the long pipe; besides these, there are large numbers of bone- and wood-mouth-pieces and others made of amber, the latter being beautifully worked.

The Meerschaum pipes from *Prussia* are not numerous, nor are they so elaborate as those of Austria. The Prussian Section presents such a series of amber specimens as are not likely to be again collected; the manufactured amber does not, however, evince much feeling for artistic design on the part of their Exhibitors, whose merits rest principally on the excellence and difficulties of the workmanship.

The contributions from the other parts of Germany consist of meerschaum and other pipes from *Bavaria*, which are not remarkable; porcelain pipes from *Hamburg*, and clay-pipes from *Nassau*. Those from Hamburg are of fancy forms, and those from Nassau are chiefly plain descriptions, which are sold at exceedingly low prices.

BRITISH COLONIES.

British Guiana.—T. B. DUGGIN sends a specimen of a pipe, or rather tube, used by the aborigines for smoking tobacco, called a Winna; it resembles a cheroot in outward appearance, but is hollow so as to contain the tobacco. It is said to be made from the rind of the fruit of the Manicole-palm (*Areca manicot*, Lodd.), from the River Berbice. It may be remarked that such tubes, made of paper covered with a leaf of tobacco, are now manufactured in England. *Canada* contributes a collection of well-made Clay-pipes. The *Indian* collection contains examples of the costly and beautifully ornamented cocoa-nut and lac-Hookahs, mounted in silver with their rich tubes or Snakes, and the simple pipe composed

of two pieces of bamboo, one for the bowl cut close to a knot and a smaller one for the tube. These primitive pipes are in common use amongst the poorer natives of India, and yet Dr. Royle cites an extemporary pipe sometimes used by the natives, which surpasses even this in simplicity; the amateur makes two holes, one longer than the other, with a piece of stick, in a clay soil, inclining the stick so that they may meet; into the shorter hole he places the tobacco, and applies his mouth to the other, and thus luxuriates in the fumes of the narcotic herb. There is, likewise, a specimen of the Singoo Opium pipe which is of very small dimensions, the tube not being larger than a thimble. The opium is placed in the bowl, and ignited by placing a piece of charcoal on it, which is effected with a small pair of tweezers, which find a place in this interesting and well-arranged collection.

CHINA.

The habit of smoking is very general in China, being common to both sexes in all classes of society, and at all ages. In every part of this vast empire the tobacco plant is cultivated, and consumed both as snuff and for smoking. So prevalent is the habit that little girls and boys are commonly seen smoking, and from this early period it is persevered in by its votaries through life. It is always customary to offer visitors a cup of tea and a pipe. M. Natalis Rondot estimates the number of smokers in China as at least 100 millions, and states that pipes are made in enormous numbers and in an almost infinite variety of forms; they are of three classes, the water-pipe, the straight-pipe, and the opium-pipe. The Chinese pipes are generally very long, and the bowl very small, it being usually made of nickel-copper (white metal). The only contribution, however, is from Dr. Berncastle, who sends an opium-pipe and appurtenances.

EGYPT.

The Specimens in the Egyptian Court comprise two Narguilés or water pipes, one of zinc and one much richer, mounted in silver; also several Pipe-bowls of Assouam and Assiout.

FRANCE.

The examples consist of clay-pipes only, from Two Exhibitors; they are very numerous, and are exceedingly well manufactured, but their forms are not such as to sustain that high reputation for graceful design which this country enjoys. This is to be attributed to the class of persons for whom the pipes are intended, and who prefer a pipe-bowl moulded into the form of some grotesque head with staring eyes, to the most elegant figures which could be devised. Very large quantities of these pipes are exported to England, Germany, Italy, the United States, and other countries, and are much esteemed on account of the very excellent quality of the earthenware of which they are formed. Their superior texture, it appears, is due in some measure to the clay of which they are chiefly composed, but principally to the great skill of the manufacturers in compounding it with other materials. To give some idea of the extent of the pipe-manufacture at St. Omer, it may be stated that one of the exhibiting manufactories—that of DUMERIL, SONS, and Co.—employs 450 workpeople, and produces annually 100,000 gross, or nearly Fifteen

million pipes, varying in price from 1*d.* per dozen to 3*d.* each; and that the other—that of L. FIOLET—employs 850 workpeople, and produces 200,000 gross, or nearly Thirty million pipes, consuming 7,874 tons of clay in their manufacture.

PERSIA.

Mr. J. B. THOMSON contributes a Narghili or Narguilé, and a lady's amber-mouth-piece; and Mr. J. HUDSON several specimens of pipes, which illustrate the luxurious habits of the Persians in smoking.

SARDINIA.

The contributions from this country consist of beautiful examples of carved meerschaum-pipe-bowls, which equal those of Austria, but are insignificant in point of number, having been contributed by only One Exhibitor.

TURKEY.

In the Turkish collection are numerous rich examples of the Narguilé, or water-pipe, in some cases composed of silver, and ornamented with precious stones; the flexible tube, or *Marpitch*, used with the Narguilé, is formed of a spiral wire covered with leather, over which another wire is coiled, so as to fall between the interstices of the inner spiral. The Turks, in smoking the Narguilé, inhale the fumes into the lungs, and never consume the last portions of the tobacco, as the smoke becomes too pungent. There are numerous examples of the Long-pipe, or *Kablioun*, and the Short-pipe, or *Chiboque*, with the Cherry-tree, Jasmine, Wild-plum, and Ebony-Tubes; and likewise the crude gimbets, with which these tubes, five feet or more in length, are bored. In boring the tube, the Turk places it above the gimblet and thus gets quit of the chips; after boring the hole half way, he meets it from the other end of the stick. The wild cherry-tree, which is principally used, seldom occurs free from defects in the bark, to repair which, so that the reparation cannot be discovered, is the chief difficulty. There are examples of Lulés or Pipe-bowls used with these tubes; they are composed of the red-clay of Nish, mixed with the white-earth of Roustchouck. They are very graceful in form, and are, in some cases, ornamented with gilding, but as the Turk prefers a fresh bowl each time, the plain ones are chiefly employed on the score of economy. It is not unusual in Turkey to compute distances, or rather the duration of a journey, by the number of pipes which might be smoked in the time necessary to accomplish it. The *Imames* or amber Mouth-pieces exhibited in the Turkish Section surpass those of any other in splendour. One Exhibitor sends four of choice amber, which are worth, together, 1,000*l.*: besides these, there are three groups from distinct Exhibitors; in the case of one was noticed an amber Cigar-tube, which is one of numerous instances of the innovations upon Turkish customs by the introduction of European ideas. If more Awards have not been made for Turkey than those cited in the list, it does not arise from want of meritorious examples, but simply because it was quite impossible to obtain a correct catalogue of Exhibitors at the time the Jury examined the articles contributed from this country.

TUNIS.

Weeds for pipes, and two embroidered Pipe-guards, are the only contributions.

TUSCANY.

The only example in the Tuscan Section is a beautifully carved ebony Pipe-tube.

UNITED KINGDOM.

The pipes in the British side of the Exhibition are unimportant ; two consist of steel, one is a contrivance for condensing the fumes of the tobacco, and the other two are of meerschaum. No common clay-pipes are exhibited ; their manufacture forms a distinct branch of the Fictile-art, and is usually practised by small makers ; the processes employed being very simple and performed with wonderful celerity. The stem of the pipe is first formed by rolling a piece of clay with the hand on a slab until it forms a cylinder slightly tapered ; a ball of clay is then attached to the thickest end, and placed in a mould formed of two halves hinged together, by merely closing the mould the clay assumes the form of the outside of the bowl ; a plunger corresponding to the intended cavity is then forced in, and the excess of clay which exudes pared off. The pipe is completed by threading the stem on to a wire, which thus forms the bore, and, after drying, it is baked in a furnace of peculiar construction.

The number of Exhibitors of Pipes and amber is Forty-nine, of these there are :—

10 Holders of a Prize Medal.
18 Who obtained Honourable Mention.
21 Unrewarded.

49

The number of Exhibitors from the various countries is as follows:—

Austria	-	-	-	-	-	-	-	-	13	} Germany 28.
Bavaria	-	-	-	-	-	-	-	-	1	
Hamburg	-	-	-	-	-	-	-	-	1	
Nassau	-	-	-	-	-	-	-	-	2	
Prussia.	-	-	-	-	-	-	-	-	11	
British colonies :—British Guiana, 1 ; Canada, 1 ; and										
India, 1	-	-	-	-	-	-	-	-	3	
China	-	-	-	-	-	-	-	-	1	
Egypt	-	-	-	-	-	-	-	-	1	
France	-	-	-	-	-	-	-	-	2	
Persia	-	-	-	-	-	-	-	-	2	
Sardinia	-	-	-	-	-	-	-	-	1	
Turkey	-	-	-	-	-	-	-	-	5	
Tuscany	-	-	-	-	-	-	-	-	1	
United Kingdom	-	-	-	-	-	-	-	-	5	
									49	

LIST OF AWARDS.

ALBA, SAMUEL, Vienna (Austria, No. 664). Honourable Mention is accorded to this Exhibitor, for a very large collection of meerschaum Pipe-bowls, Cigar-tubes, and amber Mouth-pieces. The plain bowls and cigar-tubes, and those ornamented with foliage are very creditable productions, but where human figures are introduced, they are not so well executed.

ASTRATH, CARL, Vienna (Austria, No. 666). Prize Medal, for an assortment of most exquisite specimens of meerschaum Pipe-bowls and Cigar-tubes; the sculpturing of the figures displaying remarkable artistic skill, and the execution of leafage being bold and sharp. Considering the excellence of the work, the prices are very moderate (No. 10243, 30s.; No. 10208, 45s.; Cigar-tube with figure of Venus, 45s.; another with that of Hercules, 53s.) Besides the above, the collection comprises several of the richest amber Mouth-pieces, one of which is valued at 33*l*.; some of the Mouth-pieces are flat, such as are used in Germany; others round, such as are used in the East.

BEISIEGEL, PHILIP, Vienna (Austria, No. 667). Honourable Mention, for meerschaum Pipes with silver mounts and amber Mouth-pieces; meerschaum Pipe-bowls and Cigar-tubes; cherry-tree and ebony-Pipe-tubes, and plain amber Mouth-pieces, which are all very well manufactured, and of good design.

DUMERIL, SONS, and Co., St. Omer, Pas-de-Calais (France, No. 176). Honourable Mention, for a great variety of Clay-Pipes, such as are used by the working classes, and more particularly by the peasantry. These pipes are more remarkable for their cheapness and very excellent manufacture than for any beauty of design.

FIOLET, LOUIS, St. Omer, Pas-de-Calais (France, No. 211). Honourable Mention, for a large assortment of Clay-Pipes exceedingly well-made. The bowls are mostly in the form of heads, some intentionally grotesque, and others intended to represent eminent personages, scarcely less so, on account of the eyes being picked with two dabs of black. These pipes are not remarkable for any of that excellent taste usually displayed by the French.

FLÖGE, GERHARD, Vienna (Austria, No. 670). Prize Medal. Carved meerschaum Pipe-bowls and Cigar-tubes in great variety, and of excellent designs and execution; also a large collection of Amber for smoking purposes, including the round Mouth-piece used in Turkey.

FRIEDRICH, JOHANN, Vienna (Austria, No. 671). Prize Medal. A very large assortment of meerschaum Pipe-bowls and Cigar-tubes, with amber Mouth-pieces of beautiful designs, frequently containing several figures, which are exquisitely and boldly sculptured. The prices, which vary from 17*s.* 6*d.* to 7*l.* 10*s.* each, are reasonable.

GRÜNHUT, J., Jun., Prague (Austria, No. 673). Honourable Mention is accorded for a meerschaum Pipe-bowl and two Cigar-tubes, the carving of which is very sharp and spirited.

HADJI, MIHRAN DUZOGLOU (Turkey, Nos. 1928, 1929). Prize Medal, for Four most splendid Imames or round amber Mouth-pieces, richly ornamented with brilliants; the two shortest, which in smoking are pressed against the lips, are each worth 305*l.*, and are of that peculiar colour and degree of transparency which

approaches nearest to the Turkish ideal of beauty ; the two longer Mouth-pieces are of a different form, and although not of so good a colour, nor enriched with as many diamonds, are yet worth 200*l.* each.

HARTMANN, LUDWIG, Vienna (Austria, No. 675). Prize Medal, for a very large collection of well-made Mouth-pieces of amber, mother-of-pearl, bone, and wood ; cherry-tree, and other Pipe-tubes ; hard-wood Cigar-tubes from 1*d.* to 2½*d.* each ; Walking-sticks from 9*d.* to 7*s.* 6*d.* each ; meerschaum Pipe-bowls and Cigar-tubes ; the foregoing articles are those in general use in Germany, and consequently they are not elaborately ornamented

HENDERSON, —, Montreal (Canada, No. 187). Honourable Mention is accorded for a case of well-made Clay-Pipes.

HOFFMANN, C. W., Dantzic (Prussia, No. 439). Prize Medal. A large assortment of Amber-manufactures, amongst them a pair of Candlesticks of smoky amber, 22*l.* 10*s.* ; a Letter-weight of a single piece, 9*l.* ; a Snuff-box set in gold ; and other articles which are well manufactured, but are not remarkable for beauty of design.

HOFFMANN, G. J., Dantzic (Prussia, No. 440). Honourable Mention (*the same Award by the Jury of Class XXIII.*), for a very large collection of Amber-Beads, some of which are of large size.

JANTZEN, G. E., Stolpe (Prussia, No. 205). Honourable Mention (*the same Award by the Jury of Class XXIII.*), for an assortment of Amber-manufactures, comprising Necklaces made of strings of very beautiful pearl-like beads, which are very rare ; a Ladies'-companion, the handles of the various instruments it contains, and also the needle-case and crochet-needle-holder being of amber ; besides these the Collection comprises several miniature ornaments of amber.

LUX BROTHERS, Rhula, Saxe Gotha (Prussia, No. 796). Honourable Mention, for a great variety of plain meerschaum Pipe-bowls, imitation meerschaum Bowls, painted porcelain Bowls, and carved Wood-Pipes.

MANNHEIMER, WOLFF, Königsberg (Prussia, No. 438). Honourable Mention (*the same Award by the Jury of Class I.*), for the exhibition of two unusually large pieces of Amber ; one of which is a specimen of that sort obtained in the amber pits, and has a rough exterior ; it weighs 6 lbs. : the other is marine amber, and is water-worn ; it weighs 4½ lbs.

MÜLLENBACH and THEWALD, Hoeher (Nassau, No. 10). Honourable Mention, for remarkably cheap Clay-pipes, varying in price from 6*d.* to 2*s.* per hundred.

NAIM EFFENDI, Constantinople (Turkey, 1441, 1447). Prize Medal, for a valuable collection of round amber Mouth-pieces, for the chibouque or long pipe, ornamented with rings of artificial aventurine and with jewels ; the prices of these vary, according to the size and colour of the Mouth-piece, the lowest being 37*s.* 6*d.*, and the highest 35*l.* ; and also for a collection of jasmine Pipe-tubes.

PARTSCH, A., Jun., Theresienfeld (Austria, No. 611). Honourable Mention, for an assortment of cheap clay Pipe-bowls, coloured and glazed.

ROMOLI, LUIGI, York-terrace, Chelsea (Tuscany, Nos. 118, 119). Honourable Mention, for an ebony Pipe-tube, wrought in pierced carved work.

ROY, W. VON, Dantzic (Prussia, No. 441). Honourable Mention, for a most interesting collection of all the known varieties of amber, systematically arranged in our cases, which contain likewise succinic acid, crude and pure, obtained from

amber. Also for various manufactured articles, amongst which the most remarkable is an oblong Salver, composed of separate pieces of amber arranged to form a mosaic pattern, the Royal Arms of England being engraved in the centre.

SAID AGA (Turkey, 3369, 3372). Honourable Mention, for an assortment of those amber Mouth-pieces which are in most general use in Turkey, and which vary in price from 10s. to 30s.; and also amber Cigar-tubes; and a large collection of Pipe-tubes, and wood Mouth-pieces.

STRAUSS, J., Turin (Sardinia, No. 80). Prize Medal, for several elaborately carved meerschaum Pipe-bowls, the sculpturing of which is very exquisite.

TESSLER, C. L., Stolpe (Prussia, No. 41). Honourable Mention is accorded for various manufactures in amber, among which are strings of well-formed spherical Beads, a Cigar-tube, a Ring-stand composed of different coloured ambers, the ornament and workmanship of which are very good. This Exhibitor has likewise sent a specimen of land amber, together with the fossil wood with which it is generally associated.

WINGENDER BROTHERS, Hoehr (Nassau, No. 9). Honourable Mention is accorded for an assortment of various descriptions of Clay-pipes, intended chiefly for exportation, and which are remarkable for their low price, 5s. 6d. per thousand.

WINTERFELD, J. A., Breslau (Prussia, No. 204). Prize Medal, for the largest collection of Amber-manufactures, the workmanship of which is exceedingly good: also a collection of most of the varieties of raw Amber. The manufactures comprise amber Mouth-pieces; large Pipe-tubes, composed entirely of amber; amber Cigar-tubes; Ear-rings; Necklaces; Cameo-brooches, the white opaque amber forming the figure or head; a set of Chess-men; and numerous other articles.

WÖBECKE, H. (Hamburg, No. 89). Honourable Mention, for a collection of well-made Pipes manufactured with Turkish clay.

ZEITLER, JOSEPH, Vienna (Austria, No. 687). Prize Medal. Massa Pipe-bowls and Cigar-tubes, which are manufactured from meerschaum dust. The forms of these articles are elegant, and the execution so good that they are distinguished only with difficulty from the real meerschaum. The price of massa pipe-bowls is much lower than those of the real meerschaum, and they are usually mounted with plated instead of real silver tops.

VI.—SNUFF-BOXES.

The boxes, which are known under this very general name, have exhibited equally the extremes of coarseness and of elegance. Under the former condition they will be remembered in the box of horn, brass, or japanned iron—the last, however, being known rather as a common receptacle for tobacco; and in the latter state they will be recognised in the countless portable depositories for snuff, for which all the most costly productions of nature have supplied the materials.

The word snuff is an inflection of the old northern verb *sniff*; and it existed as a term expressive of strong inhalation through the nostrils, or of angry impatience, long before the invention of the substance to which it now gives a name. Out of the latter signification originated the colloquial expression of the sixteenth and seventeenth centuries to “snuff pepper,” or to “take in snuff.” It will be

remembered that this last phrase occurs in Shakspeare's Henry IV. (Part I., Act i., sce. 3) in immediate connexion with a small box containing perfume, as displayed by the courtier who enraged Hotspur :—

“ He was perfumed like a milliner ;
And, 'twixt his finger and his thumb, he held
A Pouncet-box, which ever and anon
He gave his nose, and took 't away again ;
Who, therewith angry, when it next came there
Took it in snuff.”

The word pounce, out of which is formed pouncet-box, is supposed to have been remotely derived from *poinsonner*, to prick or pierce, and hence the claws of a hawk were called his pounces ; and pouncings, as a term relating to costume, were regarded as ornaments executed by a roll of points, or in open-work. A pouncet-box, therefore, signifies a small box having a perforated cover, containing perfumes, the scent of which escaping through the open flower-work of the top, was regarded in the sixteenth and seventeenth centuries as a preservative against contagion or poison. From the pouncet-box the perfumes, whether moist or dry, were inhaled into the nostrils ; but it was probably not until a century after the general encouragement of tobacco in England that the finely-granulated leaf became commonly established as a pungent perfume, and at length introduced the costly and elegant snuff-box.

So early, however, as the beginning of the reign of James I., a “ taker of tobacco ” was to be furnished with an apparatus greatly resembling that of a modern Scotch mull, when supplied with all its accustomed instruments, like the ram's-head boxes mounted in gilt silver, and displayed in several parts of the Great Exhibition ; as that, for instance, in Class I., No. 25 ; Class XXIII., No. 46 ; or the still finer example, No. 26, which was considered worthy of Honourable Mention by the Jury of that Class. “ Before the meat come smoking to the board,” says Dekker, in his *Gull's Hornbook*, in 1609, “ our gallant must draw out his tobacco-box, *the ladle for the cold snuff into the nostril*, the tongs and priming-iron, all which artillery may be of gold or silver, if he can reach the price of it.” Both the practice and apparatus of taking snuff are described by Howell, in 1646, as quite common in other countries ; since he says, “ The Spaniards and Irish take tobacco most in powder or smutchin, and it mightily refreshes the brain ; and I believe there's as much taken this way in Ireland as there is in pipes in England. One shall commonly see the serving-maid upon the washing-block, and the swain upon the ploughshare, when they are tired with labour, take out their boxes of smutchin, and draw it into their nostrils with a quill ; and it will beget new spirits in them, with a fresh vigour to fall to their work again.”

There is very little information extant concerning the older receptacles for snuff. In the Appendix to Volume XIII. of the *Archæologia*, published by the Society of Antiquarians (p. 395, plate xxiv.), is an engraving of two small carved cruets, found under a staircase in the Tower of London, which were exhibited to that Society in November 1797. In their general form they very much resembled powder-flasks, and were about $2\frac{1}{2}$ inches in length, and 2 inches in width ; but they were provided with screw-stoppers, to one of which was attached a small spoon. On the exterior they were ornamented with designs representing shooting of birds,

stag-hunting, and bull-baiting, and also French mottoes, evidently stamped from a mould, as if they had been formed of leather softened in hot water; but the materials of which these bottles were made is not stated.

In the extract already given from Howell's *Letters*, it is stated that so early as 1646 even the peasants in Scotland were accustomed to "take out their boxes of smutchin, and draw it into their nostrils with a quill;" which explains the intention of the spoon attached to the cruets referred to, the manufacture of which probably belongs to the early part of the seventeenth century. The word erroneously printed "smutchin" by Howell, is accurately *sneeshin*, a vulgar name for snuff, which causes sneezing: and hence sneeshin-mill (sometimes corrupted into *mull*) is the Scottish name for snuff-box. Dr. Jameson,* from whom these illustrations are derived, adds, that the word mill "is the vulgar name for a snuff-box, especially one of a cylindrical form, or resembling an inverted cone." No other name, he continues, was formerly in use; and the reason assigned for it is, that when tobacco was first introduced into this country, those who wished to have snuff were accustomed to toast the tobacco-leaves before the fire, and then bruise them with a piece of wood in the box, which was thence called a mill, because the snuff was ground in it. From these notices it is easy to perceive how a ram's horn, from its conical shape, became one of the primitive forms of the Scotch snuff-box; although at the present time it is frequently one of the most costly and luxurious. Down to the middle of the eighteenth century, the "sneeshin-horn," with the spoon and hare's foot attached to it by chains, appears to have been regarded as so completely a national characteristic, that when Baddeley played Gibby in *The Wonder*, with Garrick and Mrs. Barry, he came on the stage with such an apparatus.†

In the early part of the eighteenth century in England, fashionable snuff-boxes had probably reached the highest degree of variety and luxury. In *The Tatler*, published on Tuesday, March 7, 1710, several gold snuff-boxes are noticed, which came out last term; but that a new edition would be put out on Saturday next, which would be the only one in fashion until after Easter. "The gentleman," continues the notice, "that gave fifty pounds for the box set with diamonds, may show it till Sunday, provided he goes to church, but not after that time, there being one to be published on Monday, which will cost fourscore guineas." These costly articles, so happily satirized by Steele, are represented as the productions of a fashionable toy-man, named Charles Mather, popularly known under the name of "Bubble Boy."

Every species, however, of metal boxes, together with the "amber snuff-box" of which Sir Plume, in *The Rape of the Lock*, was "justly vain" in 1711, and the boxes made of shells mounted in gold or silver, noticed by Dodsley in 1733, are all belonging to the Reports on the other Classes of the Exhibition. To describe the manufacture of the snuff-box in all its ramifications would require that most of the known arts should be passed in review, as the greater number, not excepting even that of glass-making, have from time to time been subservient to its production. The discussion of these subjects is clearly beyond the province of the Reporters for Class XXIX., the Jurors for which were called upon to judge of such snuff-boxes

* *An Etymological Dictionary of the Scottish Language.*

† *The Gull's Horn-book*, by T. Dekker; edited by the Rev. J. Nott, 1812, p. 119.

only as are composed of papier-maché, wood, ivory, tortoiseshell, or horn : those made of glass and the various metals belonging to other classes. Notwithstanding this limitation, the Reporters have endeavoured to ascertain the number of Exhibitors who have contributed snuff-boxes in other Classes ; but there may be some examples which have escaped their observation.

The manufacture of papier-maché snuff-boxes does not call for any special notice in this place ; for although it forms a distinct branch of papier-maché work, its various processes scarcely differ in their details from those universally employed in the making of other articles. It may be remarked that the production of snuff-boxes of this material is chiefly carried on in Germany and France, whence they are exported to most parts of the civilized world.

The manufacture of those very beautiful articles, called Scotch boxes, is the only one calling for especial notice in the present Report. These ingenious productions were originally made in the village of Laurencekirk, by Mr. Stiven,* whose son and successor is present by his works in the Great Exhibition. The art, however, appears soon to have spread to other parts of Scotland : for we are informed that in 1832, in the parish of Old Cumnock in Ayrshire, upwards of a hundred persons, comprising men, women, and children, were employed in the practice of it, and in 1845 there was also an extensive manufactory of wooden snuff-boxes in the town of Mauchline.† In this work, about sixty persons were at that period employed. Judging only by the importance of the contributions to the Great Exhibition from Laurencekirk and Mauchline, it might be inferred that the latter town is at present the principal seat of the manufacture of Scotch wares ; which now includes the production of numerous other articles beside snuff-boxes.

In Classes XVII. and XXIX. are examples of covers for books and memorandum-books ; paper-knives and book-markers ; card-cases and card-trays ; spectacle-cases ; needle-books, thread-reels, crotchet-case, knitting-cases and work-boxes ; razor-cases, sheaths for razor-strops, pomatum-boxes, scent-boxes and dressing-cases ; egg-cups, tea-caddies ; and even candlesticks. To give an idea of the wholesale prices of some of these articles, the following quotations are cited :—Cigar-cases are sold at 42s. per dozen ; paper-knives from 10s. to 17s. per dozen, according to size ; snuff-boxes from 22s. to 168s. per dozen ; and netting-cases at from 5s. per dozen.

The *Scotch Snuff-box*, which has long been renowned for the perfection of its hinge and the close fitting of the cover, is cut out of the solid wood, the description chiefly employed being the sycamore or plane-tree. Mr. W. Chambers states that this is the timber used at Old Cumnock ; and that a piece of rough wood which costs 25s. will make snuff-boxes to the value of 3,000l.‡ The first operation consists in making a number of circular excavations in close contiguity to each other, by means of a centre-bit, or a drill running in a lathe ; the interior is then squared out by means of gouges and chisels, and is afterwards smoothed with files and glass-paper. The celebrated hinge is formed partly out of the substance of the box and partly out of that of the lid, the greatest attention being paid in its construction to

* *The New Statistical Account of Scotland*, Vol. xi. p. 144.

† *Ibid.*, Vol. v. p. 164. Chambers' *Gazetteer of Scotland*, p. 175.

‡ *Gazetteer of Scotland*, p. 175.

the accurate fitting of the various parts one into the other. The box is lined in the inside with stout tinfoil, and is painted on the outside with several coats of colour, each of which is rubbed down smooth with glass-paper before the succeeding coat is applied. It is then ready to receive the various styles of ornament, which, in some cases, are produced by the hand of the artist, and, in others, by mechanical means. The most usual decoration consists of the tartan patterns, the component lines of which are drawn separately by pens fixed in a ruling-machine on to the box itself, if bounded by planes or slightly-curved surfaces: although such lines were also formerly drawn by means of a rose-engine on *circular* boxes, it is now found a more convenient practice to rule the lines on paper, and then to attach the paper to the boxes. Another style of ornamentation, known by the name of "Scoto-Russian," is of more recent introduction, and imitates, in a remote degree, the beautiful enamelled silver snuff-boxes for which Russia has long been famous. In these, the outside of the box is first covered with stout tinfoil, then completely painted all over the surface, and afterwards placed in the ruling-machine, which traces upon it an intricate pattern of curved and straight lines, by means of a sharp flat tool. This instrument penetrates completely through the paint, but only scrapes the tinfoil, which is left very bright and resembles inlaid silver. Several coats of copal varnish, each of which is successively polished down, are then applied to complete the snuff-box.

In the manufactory of the Messrs. Smith, of Mauchline, which is said to be one of the largest, about Eighty artisans are employed, who have been instructed in the works. The workmen earn from 16s. to 24s. per week, according to their skill and the department in which they are engaged; and the women from 7s. to 9s. per week. An artist capable of making a copy of an oil painting earns 30s. per week.

AUSTRIA.

There are Two Exhibitors of snuff-boxes in the Austrian Section, one of whom, P. BIGAGLIA, No. 600, has contributed some beautiful specimens composed of a sparkling glass, called Artificial Aventurine: which is a silicate of oxide of copper, wherein part of the oxide of copper has been reduced to the metallic state by processes which are kept secret. The reduced copper exists in the form of minute crystals, which, under the microscope, present a most splendid appearance. Although mention is here made of these articles, they really belong to Class XXIV. The other Exhibitor has sent examples of Papier-maché snuff-boxes, glove-boxes, work-boxes, cigar-boxes, spice-boxes, and buttons, which are creditable productions of their class, and remarkable for their cheapness.

CHINA.

In the Chinese Court there is a beautifully Carved Snuff-box, sculptured out of English Cannel-coal, which was taken to China for that purpose by the Exhibitor, Captain SHEA. The carving, which it appears occupied the Chinese artist a fortnight, cost the Exhibitor only 2*l.* sterling. This specimen, however, does not strictly belong to Class XXIX., nor does it represent the snuff-box used by the Chinese. The snuff-box, or rather snuff-flask of China, is in form and size like a smelling-bottle, and is made of rock-crystal, coloured glass, porcelain, wood, and

other materials. To the stopper is attached a small spatula, for the purpose of taking out the snuff, a contrivance which has already been described as formerly in use in England.

BAVARIA.

The contributions from Bavaria, sent by Two Exhibitors, consist of Papier-maché small wares, including Snuff-boxes, which are produced at remarkably low prices, and are exported in very considerable quantities.

BRITISH COLONIES.

The *Indian* Courts contain several examples of Snuff-boxes, the most curious being—the Gourd snuff-boxes, mounted in gold and silver, from Scinde; a snuff-box made from a Cocoa-nut, highly polished; another from the Bilva fruit; and a beautiful specimen made of Buffalo-horn inlaid with metal. *St. Helena* contributes Snuff-boxes made from the willow-tree under which the remains of the great Napoleon reposed until their removal to France, and also from a willow-tree which he planted behind the library at Longwood. From *Van Diemen's Land*, J. MILLIGAN exhibits several specimens, interesting from the variety of the materials of which they are made; comprising a globular snuff-box turned out of the Tooth of the Sperm-whale, which is employed in the colony for stick-heads and similar purposes; a Turned Snuff-box of Iron-wood (*Olea Apetala*); one of the Huron-pine; and one of the Musk-wood of Tasmania (*Eurebia Argophyllum*).

FRANCE.

The beautiful examples of Snuff-boxes in the French Department are as peculiar in their style as the Laurencekirk snuff-boxes in theirs, and the manufacture of them appears to be confined to France, if not to Paris. These boxes, which are quite remarkable for the accuracy with which the hinge is made, and the close fittings of the lid, are usually lined with a veneer of tortoiseshell very highly polished. The outside or body of the box is composed of various materials, as ivory, tortoiseshell, and rhinoceros-horn, and also of petrified wood and other woods, as the maple, the olive, rosewood, and several sorts of palms cut across the grain. Some examples are very tastefully, *not showily*, ornamented with neat gold and silver mounts, but none, perhaps, are more elegant than those made of the palm-tree cut across the grain. These contributions are from Two Manufacturers, in the excellence of whose work only a very trifling difference was discernible.

GRAND DUCHY OF HESSE.

The examples from Hesse consist of Papier-maché Snuff-boxes, very similar in character to, but not so numerous or various as those of Austria and Bavaria. They were sent by One Exhibitor (No. 61), who has been rewarded for walking-sticks, and is mentioned in the section relating to them in the present Report.

PRUSSIA.

The Snuff-boxes and other articles of small wares sent from Prussia are also entirely of Papier-maché, and are principally imitations of the various descriptions of Scotch, of Tortoiseshell, and Russian boxes. They deserve commendation for the workmanship, but they are higher in price than similar goods sent from Austria and Bavaria. The following are some of the prices which were quoted as those at which the goods are sold wholesale; but judging from the examples from other parts of Germany, they seem rather to be the retail prices:—Snuff-boxes, plain, 15s. per doz.; Marbled boxes, 15s. per doz.; Scotch boxes, 15s. per doz.; Damasked, or engine-turned boxes, similar to the “Scoto-Russian,” 15s. per doz.

RUSSIA.

The contribution from Russia is the produce of One manufacturer, and consists of Papier-maché Snuff-boxes, creditably made, but exceedingly high in price. The most common snuff-boxes sell at 2s. 10d., and the dearest at 38s. each; and the cigar-boxes range from 22s. 2d. to 38s. each. In 1842 the Government of Moscow possessed Five manufactories of papier-maché snuff-boxes, which employed Eighty workpeople, and produced goods valued at 3,000*l*.

SAXONY.

From Saxony there is also a contribution of Papier-maché Snuff-boxes, ranging in price from 1s. 10d. each to 2s. 6d., the latter being an imitation of the Scotch box. There are likewise some boxes of buffalo-horn, lined with tortoiseshell, all which productions are commendable for their finish.

TURKEY.

The Snuff-boxes in the Turkish Court consist of three examples:—One of Bituminous-shale, a well-carved Mother-of-pearl snuff-box from Bethlehem, and a box made of Enamelled silver, the latter of which does not, however, belong to this Class.

UNITED KINGDOM.

Independently of the manufacturers who sent the Ram’s-head Mull, before alluded to as not belonging to Class XXIX., the Exhibitors of Snuff-boxes are only Four in number, and those deserving of especial mention are contributors of Scotch snuff-boxes. The most important display is that to be hereafter noticed in the List of Awards. The other principal collections are that of Messrs. CLARKE and DAVIDSON, of Class XVII., No. 135, and that of Mr. STIVEN, Class XXIX., No. 35, which are both deserving of favourable notice.

WURTEMBERG.

The snuff-boxes from Wurtemberg are of two kinds, and were contributed by Two Exhibitors. One of them has sent Papier-maché Snuff-boxes inlaid with mother-of-pearl and imitation gold and silver, which are very commendable as of

the better description of papier-maché work: and the second has supplied some carved Ivory snuff-boxes inlaid with mother-of-pearl, which are also deserving of praise.

The number of Exhibitors of all nations in this division is Twenty-one; of these, there are :—

5	5 Holders of a Prize Medal.
16	16 Unrewarded
21	21 Total

The classification according to the various countries is as follows :—

Austria (in addition to another Contributor, who exhibits a snuff-box of glass)	-	-	-	-	-	-	-	-	-	1
China	-	-	-	-	-	-	-	-	-	1
Bavaria	-	-	-	-	-	-	-	-	-	2
British Colonies :—India, 1 ; St. Helena, 1 ; Van Diemen's Land, 1	-	-	-	-	-	-	-	-	-	3
France	-	-	-	-	-	-	-	-	-	2
Hesse, Grand Duchy of	-	-	-	-	-	-	-	-	-	1
Prussia	-	-	-	-	-	-	-	-	-	2
Russia	-	-	-	-	-	-	-	-	-	1
Saxony	-	-	-	-	-	-	-	-	-	1
Turkey	-	-	-	-	-	-	-	-	-	1
United Kingdom (<i>beside Three Exhibitors of Rams'-head Muffs in Classes I. and XXIII.</i>)	-	-	-	-	-	-	-	-	-	4
Wurtemberg	-	-	-	-	-	-	-	-	-	2
Total	-	-	-	-	-	-	-	-	-	21

LIST OF AWARDS.

ADT BROTHERS, Ensheim (Bavaria, No. 66). Prize Medal, for an assortment of very cheap Papier-maché Small-wares, comprising Cigar-boxes, Glove-boxes, Cigar-cases, Snuff-boxes, and Memorandum-book-covers, which are well manufactured; and although artistic merit is not aimed at, the less elaborate are creditably ornamented.

COLETTA-LEFEBVRE, Paris (France, No. 458). Prize Medal, for beautifully-finished Snuff-boxes made of wood or ivory, and lined with tortoiseshell, and remarkable for the close fitting of the hinge and joint.

HOFRICHTER, C., Reichenau (Austria, No. 644). Prize Medal, for a very large assortment of Papier-maché Snuff-boxes and other Papier-maché Small-wares, comprising 167 varieties, which, taking the price into consideration, are remarkable for their cheapness and goodness of manufacture. As an example of cheapness may be cited the imitation Scotch snuff-boxes, which vary in price from 4*d.* to 7*d.* each.

MERCIER, C. V., Paris (France, No. 1658). Prize Medal, for Tortoiseshell, Palm-tree lined with tortoiseshell, and other kinds of Snuff-boxes, in all of which the workmanship is most excellent; the accuracy of the hinge and the close fitting of the joint being points particularly commendable.

SMITH, WILLIAM and ANDREW, Mauchline, Ayrshire, Scotland (Class XXIX., No. 280). Prize Medal, for a great variety of articles ornamented with Tartan-

patterns, engine-turned patterns ("Scoto-Russian"), and paintings, and comprising Snuff-boxes, Blotting-cases, Cigar-cases, and several other descriptions of Scotch small-wares, which are remarkable for the great accuracy of the workmanship, high degree of finish, and the beauty of the varnish.

E.—MANUFACTURES RELATING TO AMUSEMENTS.

I.—MANLY GAMES.

Cricket and Archery are the only games of skill and strength which are represented to an extent worthy of notice.

Cricket.

UNITED KINGDOM.

The Exhibitors of Bats and other implements used in Cricket are Nine in number, and, as might be expected, they are all British; indeed the articles they contribute are scarcely intelligible to any but Englishmen.

The implements and appliances in the nature of gloves, guards, &c., which the present mode of playing the game, and especially the practice of swift overhand bowling has brought into use, are so various that there is more room for ingenuity in the manufacture of them than might at first sight appear.

The articles contributed by DARK and SONS (197) have great merit. The gauntlets which they exhibit as designed to guard the wrist from the blow of the ball, are lined with slips of cane, and are thereby lighter than those which are thickly wadded or lined with Indian rubber, whilst they furnish a stiffer and more effectual defence against the ball.

So also in regard to the gloves which protect the fingers of the hand that holds the bat: by a tube of Indian rubber fixed along the back of each finger, an improvement is apparent in those exhibited by Messrs. Dark and Sons, inasmuch as a second and smaller tube is fixed within the first, thereby materially increasing the resistance to a blow from the ball without sensibly adding to the weight or diminishing the pliancy of the glove. The Bats exhibited by R. DARK (198) are of excellent wood and very well balanced.

DUKE and SON (No. 191) contributed a collection of all the implements used in Cricket, remarkable for the excellent workmanship and finish which they display.

The number of Exhibitors is Nine; of these, there are—

3	Holders of a Prize Medal.
6	Unrewarded.
—	
9	
—	

LIST OF AWARDS.

DARK, MATILDA, and SONS, Lord's Cricket Ground (Class XXIX., No. 197). Prize Medal, for a collection of Bats and Wickets.

DARK, ROBERT, Lord's Cricket Ground (Class XXIX., No. 198). Prize Medal

for Gauntlets, Leg-guards, Spiked-soles, Balls, and other Implements used in the Game of Cricket.

DUKE and SON, Penshurst (Class XXIX., No. 191). Prize Medal, for Implements used in the Game of Cricket.

Archery.

UNITED KINGDOM.

In Archery the British Exhibitors are Five in number.

P. MUIR and AINGE and ALDRED exhibit articles of excellent workmanship. The Bows are well balanced, and the materials from which they are made well selected, some of the woods being of great value and rarity. A bow of Spanish yew, exhibited by the last-named firm, is valued by them at 35 guineas. The Arrows also of both Exhibitors are beautiful specimens of inlaid wood.

BRITISH COLONIES.

There are several contributions of Bows and Arrows from the dependencies of Great Britain, but as they are really used as weapons, they do not belong to Class XXIX. The reader is, however, referred to the following:—*British Guiana*, Nos. 144, 145, and 145A; the *Indian Court*, which contains specimens of Bows and Arrows from Assam; Bows and Arrows from *South Africa*; and several contributions from *Western Africa*.

SWITZERLAND.

One Exhibitor sends a variety of Bows; and a case of Arrows remarkable chiefly for the number of separate pieces of wood of which they are framed. One Arrow is stated to be composed of no less than a thousand pieces.

The number of Exhibitors is Six; of these, there are—

2	2	2	2	2	2
2	4	4	4	4	4
—	—	—	—	—	—
6	6	6	6	6	6
—	—	—	—	—	—

The classification according to the various countries is as follows:—

Switzerland	-	-	1
United Kingdom	-	-	5
			—
			6
			—

LIST OF AWARDS.

AINNE and ALDRED, 126 Oxford Street (Class XXIX., No. 180). Prize Medal, for Bows, Arrows, and Archery-accoutrements, and also for Fishing-tackle.

MUIR, P., Edinburgh (Class XXIX., No. 150). Prize Medal, for Bows, Arrows, and Archery-implements.

Rackets.

UNITED KINGDOM.

A small selection of Rackets is contributed by One Exhibitor to Class XXIX. The manufacture of these, especially of the heavier and stronger, such as are used in the game of Tennis is better understood in France than in England; indeed, the rackets used in the few Tennis-courts which still exist in England are mostly imported from France.

AWARD.

JEFFERIES, ISAAC, Woolwich (Class XXIX., No. 184). Honourable Mention, for a selection of Rackets which deserve to be mentioned as promising to compete successfully with those of French manufacture.

II.—FISHING-TACKLE.

UNITED KINGDOM.

The articles exhibited under this head are, as might be expected, almost entirely of British manufacture, the sport of angling being but little pursued in other countries, and nowhere with the same study and scientific skill as in the United Kingdom. Probably there is no other country in which the manufacturers of Fishing-tackle constitute a trade in themselves, certainly none in which so much money is annually spent upon the implements which they produce. The British Exhibitors are Twenty-five in number.

The merits of many of their articles, especially of the rods, could not be completely tested within the limits of the Exhibition. The most valuable properties of a rod, consisting in the thorough seasoning of the wood, its capability to resist weather and wear, without warping or twisting, and its retention of an even spring and pliability under constant use, can be ascertained only after prolonged trial; a test which it has not been in the power of the Jurors to apply. The same may, to a great extent, be said of lines, artificial flies, and baits, the durability of which, one of their most valuable and rarest merits, must be proved by experience.

The articles exhibited by C. FARLOW, AINGE and ALDRED, J. K. FARLOW, and JONES, may all claim much credit for execution and high finish. In this respect the only distinction between their work appears to be in the amount and character of the ornaments attached to it. But it should be observed that a profuse expenditure of silver and gilding in the metal-work of a fishing-rod, the application of precious stones to the reels and joints, the inlaying of the butts with ivory and rare woods, and the use of velvet or silk, embossed and gilt, in the place of leather or other more appropriate materials, of which the books and cases for containing fishing-tackle are more usually and properly made, cannot be considered as improvements of the articles in question.

LITTLE and Co. exhibit some improvements which combine practical utility with excellent workmanship. A multiplying reel, in which, by an ingenious arrangement of the cog-wheels (the teeth of the driving-wheel being internal), the handle of the reel retains its place in the centre instead of being fixed, as is usually the

III.—TOYS.

One of the most eminent of modern physicists* has remarked that “boys’ Toys are the most philosophical things in the world;” and a renowned statesman,† taking another view of their importance, affirms that they are an index to the character of a nation.

In illustration of the first position, a few examples may be cited. A child’s kite, in the hands of a Franklin and a Romas, has served to identify lightning with electricity; and conveys an instructive lesson on the composition of mechanical forces. The pea-shooter not only affords evidence of the elastic force of gases, but also of their economical employment when used expansively. The sucker illustrates the weight of the atmosphere, and its equal pressure in all directions; and the sling, the hoop, and the top show the property of centrifugal-force: when the top is in rapid motion, it converts, for the moment, every spot and bruise on its surface into an elegant zone; and thus also imparts a good lesson in physiological optics. To a reflecting mind toys afford ample food for thought; and they might, perhaps, be made to yield much solid instruction to the child, were it not generally far more wise, for a certain period, at least, to limit its inquiries rather to the discovery of the weakest parts of its plaything.

With regard to the assertion that Toys indicate the genius of a nation, it is evident that, as the natural tendency of children is to imitate the employments of their elders, they will always take the most interest in such toys as will assist them in this propensity, and lead them in their sports to do that which they see those around them doing in earnest. Hence, in countries which are of a military disposition, flags, drums, trumpets, guns, swords, and the accoutrements of soldiers, are much in demand for the pastime of even the youngest boys. In a maritime nation toy-ships will be esteemed: and thus the very pastimes of childhood might be made available in furthering the progress of such services as the particular state most requires.

The Exhibition might, therefore, have afforded an interesting opportunity to statesmen and philanthropists for studying the diversity of character exemplified by the contributing nations, had they been all as well represented in their toys as they were in their other manufactures. This, however, was far from being the case, as will be seen from the subsequent detailed Report.

AMERICA.

The only contributions from the United States consisted of India-rubber toys, which belong to Class XXVIII.

AUSTRIA.

The Toy-trade of Austria is exceedingly well and very copiously represented in the Great Exhibition. From Vienna there are Two Exhibitors, one of whom sends a great variety of Automaton-toys; and the other a general collection of ordinary toys, military-accoutrements, guns, and swords, holding a very prominent position

* Dr. Michael Faraday.

† Mr. Richard Cobden.

among them. From Bohemia are sent excellent and very numerous examples of those very beautiful boxes of toys for which it is famous, and which form a large item in the export-trade of the country. From the mountains of Tyrol, J. B. PURGER contributes numerous specimens of carved white-wood toys, which are deserving of favourable mention, both on account of their cheapness and the goodness of the workmanship. The specimens supplied by the other Three Exhibitors will be found noticed in the List of Awards.

BAVARIA.

The chief contributions from Bavaria consist of Mechanical toys, which will be noticed in the List of Awards; and also of numerous Magnetic toys, exhibited by J. M. ISSMAVER, which are deserving of commendation for their ingenuity and variety. Both collections are from Nürnberg, in which city large quantities of these descriptions of toys are made for exportation. Besides the Exhibitors of the foregoing specimens are Two others, One of whom sends Dressed-dolls, and the other carved toys, which do not call for any particular comment.

BRITISH COLONIES.

British Guiana sends only a single example. *India*.—The Indian Court contains a very large collection of toys, chiefly from Bengal and Madras. Highly coloured and rude representations of birds* form the greater part of the display; but there are also some instances of toys which are familiar in England, as the humming-top, the merry-go-round, balancing-figures, &c. The collection comprises also several ingenious Malay puzzles, two of which are inclosed in narrow-necked bottles. Figures made in pith are likewise numerous, and are very clever productions. These toys are all such as are in common use in India, on which account they form a most valuable contribution to the Great Exhibition; but they are not nearly so well made as those of Europe. Their selection affords one striking proof, amongst numerous others, of the full appreciation, on the part of the East India Company and its numerous officials, of the objects of the Great Exhibition, and of the great energy and industry displayed by the latter in collecting even the most trivial objects of interest.

FRANCE.

One of the French Exhibitors sends two ingenious Drawing-room ornaments, containing Automaton-birds, which are toys rather for adults than children. Another Exhibitor contributes some excellent Wax-figures for hair-dressers, which are made by processes similar to those employed for producing the best description of dolls; and they are, therefore, enumerated with toys. But although France manufactures enormous quantities of toys of many kinds, only one descrip-

* It would appear from the admired Indian drama of *Sacontalâ*, written by the poet Cálidás in the first century B.C., that this kind of toy was even then known, and popular. "Go, I pray," says an attendant, in Act vii., "to my cottage, where thou wilt find a plaything made for the hermit's child Sancara: it is a peacock of earthenware, painted with rich colours."—*Works of Sir William Jones*, vol. vi. p. 302.

tion of them has been sent, and that by a single Exhibitor from Paris, who exhibits dressed dolls only. "In that capital alone," according to the *Statistique de l'Industrie à Paris*, says M. Natalis Rondot, "there were, in 1847, no less than 371 manufacturers of children's toys, employing 2,099 workpeople (641 men, 1,345 women, 80 boys, 33 girls), who, in that year, produced 172,800*l.* worth of goods." The men earn, on the average, 2*s.* 8*d.* per day, and the women 1*s.* 3½*d.* per day; but some of the men earn 2*s.* 9½*d.*, 3*s.* 2½*d.*, 4*s.* 9½*d.*, according to their skill, or the description of work they are employed on. Many of the masters employ only a single assistant, or work alone, and very few employ more than ten assistants. Thus, of the 371 manufacturers, only 62 employed more than 10; 142 employed from 2 to 10; 77 employed 1; and 90 employed no assistant, but did all the work with their own hands. Competition has, it appears, brought down prices so low, that dressed-dolls, including a bonnet, are to be bought for *eightpence per dozen*; and undressed composition dolls at *twopence halfpenny per dozen*. It is to be regretted that none of the very excellent automaton toys, boxes of games, of kitchen utensils, &c., find a place in the French Department, as these are exported from France to a considerable extent. Swords, guns, helmets, and other military accoutrements, are also, as might be expected, produced in large quantities in that country; but are disposed of chiefly for the home-trade. Most of the toy-guns are beautifully made, and are generally furnished with percussion-locks, which will fire off a cap. Conjuring-toys, for adults as well as children, ought most certainly to have been exhibited, as in the manufacture of these articles Paris has no rival. The nature of the Toy-trade in Paris is thus given by M. Natalis Rondot:—

Number of Masters.	Number of Workpeople employed.	Nature of Goods manufactured.	Value.
			£.
24	126	Military Toys - - - - -	13,346
90	805	Dolls - - - - -	48,358
25	151	Card-board Toys, games, boxes - - -	15,782
12	123	Automaton and mechanical Toys - - -	13,180
24	139	Masks - - - - -	8,496
16	42	Papier-maché animals - - - - -	5,431
16	43	Wooden carriages and horses - - -	4,426
50	94	Balls, kites, and turned Toys - - -	8,661
10	62	Toys of tin-plate and iron-plate, as kitchen utensils, &c. - - -	9,240
104	514	All other kinds - - - - -	45,880
371	2,099		172,800

Toys Exported from France.

Years.	To England.	All parts.	Valued at
	Cwts.	Cwts.	£.
1830	197	1,583	12,861
1835	174	2,562	20,822
1840	494	3,018	24,525
1845	697	5,199	42,250
1850	2,269	8,581	75,652

FRANKFORT.

J. V. ALBERT exhibits, amongst philosophical apparatus, Dolls and the Moor's-head conjuring-toy, which admits of a knife traversing the neck without severing the head. The mechanism by which this is effected, though simple, could not be made clear without a diagram.

HAMBURG.

The only contribution consists of Heads for dolls made of papier-maché and wax, which call for no comment farther than that they are largely exported to England and other countries.

PRUSSIA.

The principal Toys in the Prussian Department are those of Pewter from Berlin, which are noticed in the List of Awards. Besides these there are specimens of dressed and undressed dolls (No. 256); also a toy-goat, and a horse, of large size, both being covered with the natural skin of these animals (No 253). A. FLEISCHMANN, of Sonnenberg (who made the Model of Gulliver, exhibited in Class XXIX.), sends a "Philharmonic chandelier." This very humorous production represents M. Jullien, in the centre at the top, with the performers of his band seated round the circles of the candelabrum, in a great variety of quaint and expressive attitudes; their features and varied action being portrayed with much skill and humour.

SAXONY.

The contribution consists of a few Toys and busts made in pewter. Yet in 1846 there were Six hundred and ninety-seven manufactories of wooden toys, which employed Fifteen hundred and twenty workpeople.

SWITZERLAND.

There are not any carved white-wood toys exhibited in the Swiss Department, excepting some beautiful small models of cottages, which cannot properly be classed under this category; and which, indeed, were not brought under the notice of the Jury for Class XXIX. And as the two examples about to be mentioned are not really children's toys, Switzerland must be deemed to be quite unrepresented in this branch of manufacture. L. AUDEMARS sends a beautiful little pistol, weighing only half a grain, and, consequently, so small that it requires a microscope to bring out its details. When it is magnified about twenty times linear, all the various parts may be distinctly seen, and they then appear beautifully formed and perfect in their polish. Every part is, indeed, as complete and perfect as it is to be found in an ordinary percussion-pistol, so that the lock acts when the trigger is pulled. The second contribution is a Mechanical singing-bird from another Exhibitor, and will be found noticed in the List of Awards.

UNITED KINGDOM.

Although the number of Exhibitors of toys in Classes XXIX. and XXX., whose contributions have been examined by this Jury, is Twenty-one; yet, as the greater part of their productions consists of large models and other special objects, the United Kingdom is scarcely represented in Toys properly so called. Even of

Wax-dolls, which are made in this country in considerable numbers, there is only one contribution (Class XXIX., 122) worthy of notice; and this will be found described in the List of Awards. Rocking-horses are exhibited by J. C. DEAR (Class XXIX., 128); and H. LUCAS (127) sends an improvement on the Garden-horse, which is made to rock by means of the motion of one of the wheel-axes as the horse is dragged along. A few Compressible-toys are exhibited (216); and a variety of Automaton and other toys, chiefly foreign, are displayed by A. BOUCHET (124). With respect to the models already referred to, those exhibited at (126) will be noticed in the List of Awards. The others, which are worthy of favourable mention, are:—a landscape, with clockwork giving motion to a railway train, &c., contributed by J. T. CRIBB (Class XXX., 146); another mechanical landscape-picture, by J. L. BARRITT (Class XXX., 339); and the model of an English villa (Class XXX., 213), exhibited by M. A. SMITH. None of the ordinary strong toys of English manufacture are contributed, probably on account of the makers of these sorts being generally very poor. For most of the English wooden-toys are constructed by chamber-masters, who seldom manufacture goods to order; but, on the contrary, when they have produced a small number, hawk them about from shop to shop, or vend them in the streets. Without capital, and compelled to work almost literally from hand to mouth, they continue to exist only, without any material advance, but making much the same kinds, having the same general degree of merit one year after another. That this is no exaggeration, must be conceded by every one who will recal to mind the toys of twenty years since, and mentally contrast them with those of the present day. That the progress has been slow, and requires long intervals for comparison to make it apparent, arises from the fact that all the improvements must be made in the few leisure moments of the workmen, who are compelled to labour many hours each day to gain a livelihood, and who, probably, cannot even afford the time to carry out any suggestions which may be made to them. That the poor workman does, nevertheless, endeavour to improve in his productions, is shown by Mr. Dickens, with touching humour, in *The Cricket on the Hearth*, when Caleb is made to say, "You couldn't have the goodness to let me pinch Boxer's tail, mum, for half a moment, could you?" When surprise is expressed at the question, he thus explains his meaning: "Oh, never mind, mum; he mightn't like it, perhaps. There's a small order just come in for barking-dogs; and I should wish to go as close to natur' as I could, for sixpence. That's all. Never mind, mum." Dolls'-houses, shops, brewers'-drays, waggons, common horses, the body formed of a sort of skittle with a slice cut off on the under side, and four round pins for the legs, are made in large quantities in England. Spades, wheelbarrows, garden-rollers, garden-rakes, skipping-ropes, caoutchouc-balls, tops, kites, and similar toys, are also made in great numbers. Wax or composition dolls are made entirely in England, but wooden-dolls are imported, as are also papier-maché dolls'-heads, the bodies only being made in this country.

That very large quantities of boys' Marbles are also annually imported, we learn from the Hull collection (290), in reference to which it is stated, that 1,600 cwt. of these articles were entered at that port during the year 1850.

As toys are among those foreign productions which come under the category of "Goods Non-enumerated," the Reporters are unable to give a detailed account of

the various kinds which are brought into England ; but the following list will show the extent of this trade, with respect to the various countries which send their toys hither. The Hanseatic Towns, it must be remembered, represent Wurtemberg, Bavaria, and other parts of Germany.

Value of toys of all sorts Imported into the United Kingdom in the year 1850 :—

From	£.
Denmark - - - - -	323
Hanseatic Towns - - - - -	33,828
Holland - - - - -	6,201
Belgium - - - - -	1,056
France - - - - -	4,209
Other parts - - - - -	513
From all parts - - -	<u>46,130</u>

WURTEMBERG.

Immense quantities of toys are manufactured in Wurtemberg, more particularly on the borders of the Black Forest, and are exported to England, America, and other countries. The contributions in the Exhibition comprise most of the kinds which are manufactured in that country ; as, for example Mechanical-toys (98), which are noticed in the List of Awards ; boxes of miniature-tools, kitchen-utensils, &c., made of copper, most beautifully finished, the latter being exhibited by F. BUEHRER (59), with other things not belonging to this class. There are also kitchen, stable, and garden implements (96) ; pewter and glass toys (94 and 95) ; dolls' houses (97) ; and, lastly, two collections of very beautiful miniature ivory-work. One of these is exhibited by F. SCHMIDT (83), and although less important than a similar display (82), to be noticed in the List of Awards, is deserving of commendation for the excellence of the workmanship.

The number of Exhibitors from all parts is Fifty-one ; of these, there are—

12 Holders of a Prize Medal.
2 Who obtained Honourable Mention.
37 Unrewarded.
<u>51 Total.</u>

The classification according to the various countries is as follows :—

Austria - - - - -	4
Bavaria - - - - -	4
British Colonies and British Guiana 1 {	- - 2
„ India . 1 {	
France - - - - -	3
Frankfort - - - - -	1
Hamburg - - - - -	1
Prussia - - - - -	4
Saxony - - - - -	1
Switzerland - - - - -	2
United Kingdom (including 8 in Class XXX.) -	21
Wurtemberg - - - - -	8
Total - - - - -	<u>51</u>

LIST OF AWARDS.

ALLIX, A. J., Paris (France, No. 6). Prize Medal, for Hair-dressers' Wax Figures. These are modelled with considerable skill, and present a very life-like appearance; the hair, eyelids, and eyelashes being inserted singly in the wax in such a manner as very faithfully to represent nature. Although these models cannot be strictly considered as belonging to toys, yet their manufacture so closely resembles that of doll-making, that they are noticed in this place.

BAUTTE, T. F., Geneva (Switzerland, No. 236). Prize Medal (*Honourable Mention accorded by the Jury of Class XXIII.*), for a Paper-weight of gold, the base being ornamented with scenery painted in enamel. From this a stem ascends, and is surmounted with a small casket which opens and closes by means of clock-work. When the cover is turned back a most beautiful and perfect little bird is discovered, which is apparently singing, and at the same time fluttering its minute wings, and twirling about in different directions. As soon as the song is finished the box closes. The bird is scarcely three-quarters of an inch long, yet is most life-like in the details of its construction and its movements; and its warble is perfectly suited in compass to its size. The manufacture of such minute pieces of mechanism is most valuable training for the watchmaker, and they are therefore deserving of encouragement.

BONTEMS, —, Paris (France, No. 430). Prize Medal. The articles exhibited are of the same class as that just noticed, but considerably larger, the object being of the size of nature. They consist of two groups of Humming-birds, with clock-work movements, by which the birds are made to hop from one twig to another, at the same time opening their wings; after which they twirl suddenly round, and hop back again exactly in the manner of real birds confined in a cage. There is also a continual chirping, apparently kept up by the birds, their beaks being made to move. The levers which carry them backwards and forwards are ingeniously concealed in slits formed in the artificial branches. Other birds are represented continually pecking at beetles. The price of one of these groups of automata is 12*l.*, and of the other with the clock, 18*l.* Both groups are under glass shades, and form singularly pleasing drawing-room ornaments.

BOUCHET, A., Baker Street (Class XXIX., No. 124). Honourable Mention. The Toys exhibited consist of children's Armour, French boxes of Games, a representation of the Great Exhibition, with moving figures, Shops, and various Dolls.

EICHNEB, G., Nuremberg (Bavaria, No. 80). Prize Medal, for Twenty Mechanical toys. These articles, which are made of tinned iron-plate and painted, are quite remarkable for the neatness with which they are finished. They consist chiefly of Carriages with horses, the latter being moved by cranks and levers connected with the wheels. The following specimens are deserving of especial notice:—A Carriage with a pair of horses, 24*s.*; a Carriage with four horses, the carriage containing figures representing Her Majesty and Prince Albert, 40*s.*; a State-carriage, 48*s.*; a Sportsman's-carriage, 6*s.* 6*d.*; and another similar specimen, 4*s.*

HALLER'S, J., WIDOW and SON-IN-LAW, Vienna (Austria, No. 652). Prize Medal, for a collection of upwards of Three hundred Children's Toys, comprising

Dolls, dressed and undressed, miniature Furniture, Shops, Drums, Flags, Swords, Guns, Lances, Shakos, Helmets, and other military accoutrements for children, the commoner descriptions of Mechanical-toys, many of which display much ingenuity. There are also numerous other sorts of toys in this collection, which are arranged in the manner of a trophy, and form the largest group in the Exhibition.

JUMEAU, P., Paris (France, No. 1282). Prize Medal for Dolls'-dresses. The dolls on which these dresses are displayed present no point worthy of commendation, but the dresses themselves are very beautiful productions. Not only are the outer robes accurate representations of the prevailing fashions in ladies' dresses, but the under garments are also, in many cases, complete fac-similes of those articles of wearing apparel. They might serve as excellent patterns for children to imitate, and thus to acquire the use of the needle, with a knowledge of the arrangement of colours and material; in the latter respects they might indeed afford valuable instruction to adults.

KIETAIBL, F., Vienna (Austria, No. 653). Prize Medal, for a collection of Thirty-nine Automaton Toys. These toys, which are all moved by good metallic clock-work, are most ingenious productions, but they appear to be more expensive than similar manufactures produced in France, with which, unfortunately, the Exhibition afforded no opportunity of comparison. The following are among those deserving of especial notice:—Male and female figures waltzing, 12s., the contrivance for effecting the occasional rapid rotation of the German waltz being very ingenious; a Pianiste (51s.), who plays, or rather appears to play, "God save the Queen" and "Rule Britannia;" an elephant carrying a Howdah; and four walking Indians carrying a palanquin. This collection is the only one of detached locomotive figures.

MONTANARI, AUGUSTA, Upper Charlotte Street, Fitzroy Square (Class XXIX., No. 122). Prize Medal. The display of this Exhibitor is the most remarkable and beautiful collection of Toys in the Great Exhibition. It consists of a series of Dolls, representing all ages, from infancy to womanhood, arranged in several family groups, with suitable and elegant model-furniture. These dolls have the hair, eyelashes, and eyelids separately inserted in the wax, and are, in other respects, modelled with life-like truthfulness. Much skill is also evinced in the variety of expression which is given to these figures in regard of the ages and stations which they are intended to represent. From the prices of these dolls, however, they are adapted rather for the children of the wealthy than for general sale; since the prices of the undressed-dolls are from 10s. to 105s. each; the dressed-dolls, which are attired with much taste, are much more expensive, and vary in price according to the richness of the material of which the robes are made. In a small case adjoining that which contains the toys just enumerated, are displayed several Rag-dolls, which are very remarkable productions, considering the materials of which they are made. They consist entirely of textile fabrics, and the dolls which are intended, and are well adapted for the nursery, are reasonable in price, varying from 6s. 6d. to 30s. per doll, including the dresses.

MÜLLER, C. A., and Co., Oberleutensdorf, Bohemia (Austria, No. 654). Honourable Mention, for nearly Two hundred Boxes of Toys. These boxes are filled with excellent figures representing men and animals, which are modelled in a sort of papier-maché, with trees and rocks, the former being made of wood, and the latter

of paper. The different series representing Hunting-scenes, Zoological-gardens, Herds of cattle, and numerous other groups illustrative of rural domestic life. The truthful delineation of the various animals is a feature deserving of great commendation, as it renders the toys well adapted to afford instruction as well as amusement. The wholesale prices quoted were 11*d.*, 1*s.* 0½*d.*, 7*s.* 10*d.*, and 10*s.* 6*d.* per box, according to the number and size of the objects contained in it. For instance, the box for 10*s.* 6*d.* contained the following objects representing stag-shooting:—3 rocks, 12 large trees, 25 small trees, 17 stags in various positions, 3 huntsmen, and 3 dogs.

ROCK and GRANER, Biberach (Wurtemberg, No. 98). Prize Medal, for a large collection of mechanical and other toys, some made of tinned iron-plate, and others in papier-maché. It comprises: Carriages with horses which are moved by the revolving parts by means of cranks and links; a Water-mill, to be acted upon by real water; a Cascade and fountain, in which, also, real water is to be used; a working-model of a pump; collections of kitchen utensils, a complete set containing many pieces being charged 6*s.* 8*d.*; and numerous other articles.

SÖHLKE, G., Berlin (Prussia, No. 265). Prize Medal, for a collection of Pewter-toys; the principal example being a representation of the review at Windsor, on the occasion of the visit to England of the Emperor of Russia, who is portrayed among the numerous figures which this well-executed model contains. Besides this specimen, there are several miniature Dinner and Tea services, also cast in pewter.

SPURIN, E. C., New Bond Street (Class XXIX., No. 126). Prize Medal, for two Models, one representing an English farmyard, and the other Gulliver in Lilliput. The Farm-yard is an ingenious model, representing with fidelity the various buildings and the every-day business of such a place; as the feeding of poultry, pumping of water for cattle, thrashing of corn by horse-power, winnowing of grain, &c.: the various figures being moved by clock-work.

The second model was executed by A. Fleischmann of Sonnenberg, who also exhibits a comic chandelier in the Prussian Department. It represents one of the incidents in Swift's well-known romance, when Gulliver wakes in the country of Lilliput, and finds himself "unable to stir." "As I happened," he continues, "to lie on my back, I found my arms and legs were strongly fastened on each side to the ground, and my hair, which was long and thick, tied down in the same manner. I likewise felt several slender ligatures across my body, from my armpits to my thighs." Such an incident affords ample scope for the imagination of the artist, and he has proved himself quite equal to the undertaking. There is much humour evinced in the physiognomy and expression and action of the Lilliputians, some of whom are bold enough to push their inquiries so far as to pry into Gulliver's waistcoat-pockets, a piece of temerity which is nigh costing one philosopher-looking individual his life. Others of the natives, however, are far more cautious, and mounted, in fancied security, upon the branches of trees which Gulliver might blow down with a breath, they content themselves with a more distant view of him: others again prefer trusting to the ground and their own legs, and some of them are already on the start at the first signs of waking on the part of the man-monster: some slow, dull-headed individuals, not knowing

what is taking place, are eagerly climbing up on his body, whilst others are precipitately sliding down; and even the Lilliputian horses seem to have their presentiment of danger, and are becoming unmanageable.

WITTICH, KEMMEL, and Co., Geisslingen (Wurtemberg, No. 82). Prize Medal, for upwards of Two hundred Bone and Ivory small-wares. The chief part of this collection consists of very small and exquisite Models of furniture, in which there are much minute piercing and carving which, in this respect, exhibit great skill on the part of the workman: these miniature works are much used as chimney-ornaments in Germany. There are also numerous children's Toys: as, rattles, $6\frac{1}{2}d.$ each; spelicans, 2s. the set, in which those with figures are fairly carved, considering the nature of the goods and their prices. Umbrella and stick-handles form also an item of these productions, and present several examples of good carving, as, for instance, one representing bears climbing a pole, valued at 22s. Lastly, there are several small articles, such as ladies' brooches, and ladies'-companions or cases, containing bodkins, crochet-needles, &c., which are sold for 1s. each. The whole of the productions are well manufactured, and reasonable in price.

F.—MISCELLANEOUS.

In addition to the various manufactures already noticed in the previous remarks, there are productions from no less than Eighty Exhibitors of so miscellaneous a character that they do not admit of being classified under any one of the numerous subdivisions already specified. Of these, however, it must be remarked that braid, sewing-cotton, felt, wire-buttons, bone-buttons, pins, needles, fish-hooks, printers' type-cases, black-lead pencils, pencil-tips, large fishing-tackle (including large nets), casks and models of vats, shoemaker's lasts, gig-whips, hot-water and steam-apparatus, sash-line, sheets of woven wool, cotton and worsted bobbins, and the covering for stacks, do not belong to this Class, and were, therefore, not examined by this Jury. Of these various manufactures, there are Twenty-one exhibitors, leaving still Fifty-nine belonging to the present Class XXIX. Of these, there are:—

Prussian	-	-	-	-	-	2
British	-	-	-	-	-	57
Total	-	-	-	-	-	59

The contributions of these Exhibitors were carefully examined, but no Awards were made in their favour. The following, in Class XXIX., are, nevertheless, worthy of notice:—

BURNISHING-STONES.

T. CHAMBERLAIN (231) exhibits specimens of Burnishing-stones for the use of silversmiths, of which both the rough and the finished stones are displayed.

CONFECTIONERS' MOULDS.

LEALE and ALBRECHT (108) exhibit several well-made jelly and cake-moulds.

LETTERS FOR STICKING ON GLASS AND DOOR-PLATES.

H. FLETCHER (240) exhibits Letters to be fixed on glass; and, also, engraved door-plates filled with a composition said not to be liable to crack in the sun, a very valuable improvement which, however, can be only tested by time.

G. LUCAS (277) exhibits brass and zinc door-plates engraved by machinery, and also filled with a composition said to be not liable to crack in the sun, nor to be acted upon by the atmosphere.

GLASS AND EMERY PAPER, AND CLOTH.

BARSHAM, SON, and Co. (213), and R. and H. ROBERTS (215), exhibit excellent specimens of Glass and Emery cloth, and glass and emery paper; and also of the powdered glass and emery of different degrees of fineness, which are used in their manufacture.

ORNAMENTAL PAPER-WORK.

There are several examples of Cut-paper ornaments both in Class XXIX. and Class XXX. The only contribution, however, which need be noticed, is a very beautiful Paper Transparency, representing Chepstow Castle, Monmouthshire, by moonlight, which is exhibited by S. HERBERT (Class XXIX., 301). The effect, which resembles very closely that of the porcelain pictures, is produced by many over-laying sheets of tissue-paper, cut out in the proper form with scissors, a work requiring much patience as well as skill.

WAFERS.

H. THOMPSON (209) exhibits very beautiful specimens of Cameo-wafers, a manufacture, to a great extent, superseded by the very general employment of envelopes having their seal-flaps gummed and embossed.

The remaining contributions are too unimportant to require enumeration in this Report, especially as they are amply described in the *Illustrated Catalogue*.

(Signed)

WARREN DE LA RUE, Ph. D., *Reporter*.

A. W. HOFMANN, Ph. D., *Joint Reporter*.

London, March 1852.



THE AMAZON.
(ZINC, BRONZED)

KISS.

CLASS XXX.

REPORT ON SCULPTURE, MODELS, AND PLASTIC ART.

Jury.

- G. Von VIEBAHN, *Chairman*, Zollverein; Privy Councillor in the Department of Commerce at Berlin.
Lord COLBORNE, *Deputy Chairman*, 19 Hill Street, Berkeley Square.
ANTONIO PANIZZI, *Reporter* (Tuscany), British Museum; Keeper of the Printed Books at the British Museum.
C. R. COCKERELL, R.A., Bank of England; Architect.
J. GIBSON, R.A., 7 Tilney Street, Park Lane; Sculptor.
Lord HOLLAND (Tuscany); Minister at the Court of Turin.
Count LEON DE LABORDE, France; Member of Institute, &c.
General GEORGE MANLEY, 19 Rutland Gate; formerly Adjutant-General in Rome.
C. T. NEWTON, British Museum; Assistant in the Antiquarian Department of the British Museum.
A. W. PUGIN, St. Augustine, West Cliff, Ramsgate; Architect.
LAMBERT A. J. QUETELET, Belgium; Secretary of the Academy of Fine Arts, and President of the Circle-Artistique, Brussels.
RICHARD REDGRAVE, R.A., 18 Hyde Park Gate South, Kensington Gore; Artist.
Y. D. C. SEURMONDT, Holland; late Master of the Mint at Utrecht.
Dr. C. WAAGEN, Zollverein, Director of the Museum of Fine Arts at Berlin.
W. WYON, R.A., Her Majesty's Mint; Medalist.
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THE Jury of Class XXX. assembled for the first time on Monday the 12th of May, 1851. In compliance with the instructions received from the Council of Chairmen, the Jury proceeded to elect a Deputy-Chairman, to make arrangements as to the time and place of their future meetings, and to nominate Sub-Committees, who should lay before the Jury detailed reports upon the several points of inquiry specially assigned to them. Lord Colborne was elected Deputy-Chairman; and at a subsequent meeting the undersigned had the honour to be appointed Reporter.

The Sub-Committees having brought their investigations to a close with the utmost despatch consistent with the due performance of the arduous duties intrusted to them, severally laid their reports before the Jury, who, after the most mature and anxious consideration, have agreed upon their awards now submitted to the Royal Commissioners through the Council of Chairmen. As the Jury of Class XXX. forms a group by itself, and is not part of any other group of Juries, its awards have not been submitted to any other Jury or Juries for confirmation, as would otherwise have been the case, according to the 12th Instruction from the Council of Chairmen. The Jury, however, considered it expedient to hold a special meeting as a group, and at that meeting the awards

previously made were reconsidered and finally settled by the Jurors. It is therefore upon the Jury of Class XXX. alone that the whole responsibility of the awards in the Class of Fine Arts rests.

In making these awards the Jury have acted strictly in accordance with the principle laid down by the Council of Chairmen in their 15th Instruction. They have been guided solely by the merit which they have recognized in the individual works exhibited, without reference to countries, and considering the Exhibition as a whole. And in compliance with the 20th Instruction, the Jury of Class XXX. have made the proportion of the Council to the Prize Medal, a very small one. Even had this instruction not been laid down in such precise terms by the Council of Chairmen, the Jury of Class XXX. would have felt it their duty to exercise great reserve in awarding Council Medals, knowing, on the one hand, that superior excellence is but very rarely attained, particularly in such works as fell within their jurisdiction, and being aware, on the other, that it was only "for very pre-eminent merit" that the Great Medal was intended.

It having already been explicitly stated that the Jury in making their awards were guided solely by the merit which they have recognized in the works exhibited, it might be deemed superfluous to add more on this point; there are, however, one or two facts, obvious indeed, but yet of sufficient importance to be recalled to the minds of such persons as might be led by the decisions of the Jury to draw invidious comparisons between one country and another. It is an obvious but most important fact to be borne in mind, that with respect to the principal branch of the subjects falling under Class XXX. (Sculpture), foreigners have laboured under peculiar difficulties in having had to bring over from distant parts, and at considerable expense and risk, statues in marble or bronze for the Exhibition. Again, all foreign artists have not enjoyed the same means of overcoming these difficulties. In many cases their governments have given facilities and assistance towards this object, but, even then, this assistance and these facilities have varied in extent. The Jury could not moreover but feel and regret the absence from the list of exhibitors of the names of some of the most distinguished artists in Europe. It might be invidious to mention individuals, but it would be unjust to pass over the fact unnoticed. Among the works, however, by natives of the United Kingdom, to which Medals have been awarded, there are two deserving notice on account of their being exhibited among the Roman sculptures—a graceful acknowledgement of the advantages derived by the artists from that school on which their eminent success reflects so much credit.

The scope and nature of the works on which the Jury of Class XXX. were called upon to adjudicate, gave to their position and duties a special character, and must necessarily impose a peculiar line of conduct upon the Reporter.

There is no doubt, for instance, that a history, however rapid, of the rise, progress, and present state of most classes of industry represented in the Exhibition, will, in the majority of cases, form a part of, and add considerably to, the value of the several Reports, but to attempt such an historical sketch with reference to the Fine Arts, must, of necessity, prove unsatisfactory and worse than useless. The Jury believe, however, that their awards will give a just idea of the present state of the Fine Arts as shown in this Exhibition; and they here wish to express their gratification in observing the universally growing taste

for objects of art, and the increasing estimation in which they are held. They have noticed with equal pleasure, that industry directed by science fosters this popular tendency. By the novel and successful adaptation of cheap materials and of economical processes to the multiplication of works of art, the best models are daily brought more and more within the reach of all classes. New and pure sources of enjoyment, hitherto the privilege of the few, are thus opened to all the members of civilized society. Again, the diffusion of good taste in the Fine Arts cannot but beneficially affect the productions of industry generally, so that what has hitherto been valued merely for its usefulness, may, in many cases, be rendered an object of attraction to a cultivated eye and a refined mind.

The Jury of Class XXX. have been most anxious not to pass over any of the numerous objects in the Exhibition, which it might properly be considered to be their duty to examine. They think it unlikely that any article deserving notice should have escaped their repeated, minute, and diligent inquiries. On the other hand, this Jury have occasionally abstained from examining objects, respecting which, owing to the necessarily uncertain limits of the several classes, doubt might be entertained whether they strictly belonged to Fine Arts or not. Should the Jury of Class XXX. have been led in some few instances to limit their jurisdiction too much, they have the satisfaction of feeling that ample justice has been rendered to exhibitors by those Juries, to whose judgment such objects as have not been considered to belong to this class have been finally submitted. Thus the Jury of Class XXX. have purposely abstained from judging of such metal-casts as they conceived to have been exhibited merely for the purpose of showing either the successful result of a new process, or the novel use of a particular metal. In this case they were aware that another Jury were about to take these points into their consideration, and judge of these objects as specimens of mechanical industry. In some few exceptional cases, such, for instance, as those of MESSRS. PEREZ, WEISHAUP, &c., certain objects have appeared to possess so strong a claim to be noticed in this class, that the Jury have not hesitated to distinguish them by an award, although aware that they had been rewarded by other Juries; but whenever such instances of double awards have been made known to this Jury, the fact has been noticed in this Report.

The Jury would willingly have endeavoured to state, as directed by the 20th instruction of the Council of Chairmen, the several grounds upon which four of the Great Medals have been recommended by them, but it has been found impossible to comply with such an instruction with respect to objects of sculpture, although the Jury felt how desirable it was that such an instruction should be observed in those cases in which the elements out of which the Juries were to form their judgment, were of a more definite and more uniformly appreciable nature.

At a meeting held on the 5th of June, long before the question of individual awards came under consideration, the Jury agreed upon the following resolution :—

“That it is not desirable to assign the Council Medal to every object of art pre-eminently beautiful or excellent in its kind, whether it be executed in an inferior section of the Class or not; but that it should be rather limited to the highest works of the highest class.” This resolution, consistent with the view of the Fine Arts taken throughout by this Jury, precluded them from awarding the highest

honours to any but works of art of the highest class. Their awards must not, therefore, be compared with those of other Juries guided by different principles, but must be tested only by the rules which the Jurors of Class XXX. have laid down for their own guidance. The holders of the several marks of approbation by which this Jury have distinguished merit ought to appreciate them according to the high value set upon these several marks of approbation by those who conferred them.

In forming their judgment upon works in the highest branch of art coming within their jurisdiction, the Jury have principally looked for the embodiment of ideas, thought, feeling, and passion; not for the mere imitation of nature, however true in detail, or admirable in execution. They have looked for originality of invention, less or more happily expressed in that style which has for twenty-three centuries been the wonder of every civilized people, and the standard of excellence to which artists of the highest order have endeavoured to attain. Wherever indications of originality, chastened by a successful adaptation of this style have been met with, the Jury have acknowledged a corresponding amount of merit; and it is this originality of conception improved by such style, which the Jury have recognized by the honours placed at their disposal. They have endeavoured to record in the most emphatic manner their anxious wish that artists should study to give their ideas that form and life which spiritualizes every-day nature, and elevates the work of art to the place of a type of nature itself. The Jury of Class XXX. would point to the remains of the Parthenon as embodying the result of the great principles which they have been anxious to inculcate, and which they desire to see universally adopted. The limited number of Council Medals awarded must not therefore be regarded as a proof of deficiency of talent in the bulk of the works exhibited, but as evidence of the severity with which the principles adopted by the Jury have been applied.

It was agreed to recommend that Council Medals should be awarded to the following works:—

To Professor A. KISS, of Berlin, for his group cast in zinc, and bronzed by M. GEISS, representing an Amazon on horseback attacked by a Tiger. (Prussia, No. 279.)

To Baron MAROCHETTI, of Turin, now of London, for his colossal equestrian statue, in plaster, of Richard Cœur de Lion. (Outside West, 76.)

To M. J. PRADIER, of Paris, Member of the Institute, for his marble statue of Phryne. (France, No. 1407.)

To the representatives of the late Mr. RICHARD J. WYATT, for his marble statue of Glycera. Exhibited by Captain LEYLAND. (Main Avenue East, No. 103.)

It was the unanimous impulse of the Jury on the awards being taken into consideration, to recommend that the same high distinction should be conferred on Mr. GIBSON, for his marble group of a Hunter and Dog, exhibited by the Earl of YARBOROUGH. Their intention was defeated by Mr. Gibson himself, who, well knowing that should he accept the office of a Juror of Class XXX., he could no longer receive a prize from that Jury, preferred serving his brother artists to his own individual gratification, and thus disqualified himself for receiving the honour which he had so well deserved.



RICHARD CŒUR DE LION.
(PLASTER)

MAROCHETTI.

DIVISION A.—SCULPTURE AS A FINE ART.*

Section A.—1. In Metals simple, as Gold, Silver, Copper, Iron, Zinc, Lead, &c.

In this section of the works submitted to their judgment, the Jury awarded the Prize Medal to the following work, it being however understood that for this class of reward, when more than one article was exhibited by the same artist, the Jury might, if they thought it expedient, cumulate in their judgment the various species of merit which they recognized in the several productions.

To Messrs. C. M. WEISHAUP T SONS, of Hanau, for a Set of Chess-men and Board, in silver and gold, ornamented with enamel. Although aware that the merit of these articles has been acknowledged by another Jury, the Jury of Class XXX. wished to record their opinion of them as objects of art. (Prussia, No. 412.)

The Jury were of opinion that the following artists were deserving of Honourable Mention :—

Mr. A. VECHTE, of London, for his designs for silver works executed by him for the exhibitors, Messrs. HUNT and ROSKELL. Although a Council Medal has been awarded to the exhibitors by another Jury, the Jury of Class XXX. considered it just to record their opinion of the merits of this artist. (Class XXIII., No. 97.)

The Jury of Class XXX. have heard with great satisfaction that another Jury have suitably acknowledged the excellent workmanship of the Shield presented by His Majesty the King of Prussia to H. R. H. the Prince of Wales, on whose behalf it has been exhibited by H. R. H. PRINCE ALBERT. They think it, however, their duty to add that the several eminent artists who have contributed to the execution of the design of Director Cornelius, deserve the special praise of the Jury of Class XXX., for the taste and skill which they have respectively displayed in this work. (Main Avenue East, No. 98.)

Section A.—2. In Metals compound, as Bronze, Electrum, &c.

The following Prize Medals were awarded in this section :—

To Mr. JOHN BELL, of London, for his Eagle Slayer, cast in bronze by the Coalbrook Dale Company. (Main Avenue West, No. 53.)

To M. JEAN DEBAY, of Paris, for his bronze group representing the Death of the Stag. (Main Avenue East.)

To M. FRATIN, of Paris, for a group of Eagles in bronze. (France, No. 1235.)

To M. E. L. LEQUESNE, of Paris (?), for his bronze statue of a Dancing Faun. (Main Avenue East.)

The Jury were of opinion that the following artists were deserving of Honourable Mention :—

M. — BONNASSIEUX, of Paris, for a bronze figure representing Cupid cutting his wings. (France, No. 64.)

* The classification of awards is according to that adopted in the "Head Juries."

M. C. CORDIER, of Paris, for his Head of a Negro in bronze. (France, No. 460.)

Mr. T. KALIDE, of Berlin, for his group in bronze of a Boy with a Swan. (Prussia, No. 285. Prize Medal awarded, Class XXII.)

M. P. J. MENE, of Paris, for his several Animals in bronze. (France, No. 630. Prize Medal awarded, Class XXII.)

M. C. MOELLER, of Berlin, for two bronze groups representing a Boy with a Newfoundland Dog, and a Girl with a Bulldog. (Prussia, No. 292.)

Section A.—3. In Minerals Simple, as Marble, Stone, Gems, Clay, &c.

The following Prize Medals were awarded in this section:—

To Mr. E. H. BAILY, of London, for his two plaster statues of a Nymph preparing for bathing, and of a Youth resting after the Chase. (South Transept, Nos. 6 and 7.)

To Mr. JOHN BELL, of London, for his plaster statue of Viscount Falkland, no Prize Medal was specially awarded, as he had already received one for his "Eagle Slayer," in bronze. (North Transept, No. 28.)

To M. GIO. MARIO BENZONI, of Rome, for his statue in marble representing Gratitude. (Rome, No. 16.)

To M. AUGUSTE DEBAY, of Paris, for his group in marble representing Eve, with Cain and Abel asleep in her arms, and designated as the "Premier Berceau." (France, No. 45.)

To Professor F. DRAKE, of Berlin, for a reduced cast in plaster of part of the marble pedestal to the monument of Frederic William III. of Prussia. (Prussia, No. 273.)

To M. A. ETEX, of Paris, for his various works of sculpture in plaster and marble. (France, No. 1215.)

To Mr. J. H. FOLEY, of London, for his plaster statue of a Youth at a Stream; also for his plaster group representing Ino and Bacchus. (North Transept, No. 47, Sculpture Court, No. 19.)

To M. I. FRACCAROLI, of Verona, for his two statues in marble, representing Achilles wounded, and David slinging the stone. (Austria, No. 710.)

To M. C. A. FRAIKIN, of Schaerbeck, near Brussels, for a plaster group of Psyche carrying off Cupid. (Belgium, No. 465.)

To M. A. GALLI, of Milan, for his marble statue of Susannah. (Austria, No. 711.)

To M. G. GEEFS, of Schaerbeck, near Brussels, for a plaster group representing a Lion in love. (Belgium, No. 466.)

To Mr. J. HOGAN, of London, for his reclining figure in plaster representing a Drunken Faun. (Sculpture Court, No. 14.)

To Mr. B. JENNINGS, of London, for his marble statue of Cupid. (Sculpture Court, No. 81.)

To M. J. A. JERICHAU, of Copenhagen, for a group in plaster representing a Hunter carrying off the Cub of a Panther. (Denmark, No. 39.)

To Mr. J. LAWLOR, of London, for a statue in plaster representing a Bather. (Sculpture Court, No. 22.)



HUNTER AND PANTHER.
(PLASTER)

JERICHAU.

To M. A. LECHESNE, of Paris, for his two casts in plaster representing two groups of a Child protected from a Snake by a Dog. (Main Avenue East, No. 573.)

To Mr. LAWRENCE MACDONALD, now at Rome, for an Iconic statue in marble. (Rome, No. 18.)

To Mr. P. MACDOWELL, of London, for his plaster statue of Eve; also for his statues of Cupid, and of a Girl at Prayer, in marble. (South Transept, Nos. 22, 23, 24.)

To Mr. WILLIAM C. MARSHALL, of London, for his plaster figure of Sabrina. (Sculpture Court, No. 15.)

To M. RAFFAELLE MONTI, of Milan, for his marble statue of Eve after the Fall. (Austria, No. 746.)

To Mr. HIRAM POWERS, from the United States of America, for a statue in marble representing a Greek Slave. (No. 522.)

To M. J. M. RAMUS, of Paris, for his marble group representing Cephalus and Procris. (France, No. 1419.)

To Professor ERNST RIETSCHEL, of Dresden, for his plaster group designated as "La Pietà," representing Mary kneeling at the Dead Body of our Saviour; and for his bas-reliefs in marble. (Saxony, No. 185.)

To Mr. T. SHARP, of London, for his marble figure representing a Boy frightened by a Lizard. (Sculpture Court, No. 20.)

To M. E. SIMONIS, of Brussels, for his equestrian statue of Godfrey of Bouillon, in plaster; and for other works. (Belgium, No. 464.)

To M. G. STRAZZA, of Milan, for his reclining figure, in marble, representing Ishmael. (Austria, No. 713.)

To Mr. E. THRUPP, of London, for his marble statue of a Boy catching a Butterfly; also for a marble figure representing Arethusa. (Sculpture Court, Nos. 56 and 58.)

To M. J. TUERLINCKX, of Malines, for a statue in marble representing Giotto. (Belgium, No. 456.)

To the REPRESENTATIVES of the late Mr. M. L. WATSON, of London, for his marble statue of the sculptor Flaxman, exhibited by Mr. Franks; and for his two statues, likewise in marble, of the first Earl of Eldon, and of his brother Lord Stowell, exhibited by the present Earl of Eldon. (Sculpture Court, No. 60, and Main Avenue West, No. 81.)

To M. ALBERT WOLFF, of Berlin, for his marble group of a Girl with a Lamb, representing "Innocence." (Prussia, No. 307.)

The Jury were of opinion that the following artists were deserving of Honourable Mention:—

Mr. WILLIAM BEHNES, of London, for his marble statue representing a Startled Nymph. (Sculpture Court, No. 54.)

M. H. W. BISSEN, of Copenhagen, for his plaster statue of Orestes, and for other sculptures. (Denmark, No. 38.)

M. T. CLESINGER, of Besançon, for his marble figure of a Bacchante. The Jury, for reasons totally independent of the acknowledged merits of this young artist, abstained, with regret, from awarding a high mark of approbation to this work. (France, No. 419.)

Professor A. COSTOLI, of Florence, for a marble statue of a Dying Gladiator,

exhibited by the Rev. John Sandford.* The work by the same artist described under Tuscany, No. 106 of the General Catalogue, was not exhibited.

Mr. J. ENGEL, from Hungary, for his marble group representing an episode in the history of the war between the Amazons and the Argonauts. (South Transept, No. 15.)

Mr. P. FRECCIA, of Florence, for his marble statue of Psyche. (Tuscany, No. 110.)

Mr. J. GEEFS, of Antwerp, for his plaster statue, "The Faithful Messenger." (Belgium, No. 451.)

Mr. JOSEPH JAQUET, of Schaerbeek, near Brussels, for his plaster statue representing Cupid disarmed. (Belgium, No. 461.)

Mr. J. LEEB, of Munich, for his marble statue of a Girl carrying a Nest of Cupids. (Bavaria, No. 89.)

Mr. L. MARCHESI, of Milan, for his statue in marble representing Eurydice. (Austria, No. 716.)

Mr. F. M. MILLER, of London, for his marble group, "The Orphans." (No. 98A, Main Avenue East.)

Professor L. NENCINI, of Florence, for his reclining marble figure of Bacchus. (Tuscany, No. 108.)

M. MICHEL PASCAL, of Paris, for his model in marble of a Friar presenting the Crucifix to two Children. (France, No. 1660.)

Mr. A. SANGIORGIO, of Milan, for his marble bust of the poet Vincenzo Monti. (Austria, No. 722.)

Mr. E. B. STEPHENS, of London, for his plaster group representing a Deer-stalker and Dog. (North Transept, No. 29.)

Mr. W. THEED, of London, for his sculptures in marble and plaster. (Sculpture Court, Nos. 13, 59, and 79.)

Mr. and Mrs. T. THORNYCROFT, of London, for their statues in plaster of the Royal Children, represented as the Seasons. (Sculpture Court, No. 34.)

M. T. WAGNER, of Stuttgart, for a figure in marble representing Mary Magdalen. (Wurtemberg, No. 108.)

Mr. H. WEEKES, of London, for his marble group, representing a sleeping child and dog. (South Transept, No. 21.)

Section A. 4.—In elaborate Mineral Materials, as Glass, Porcelain, &c.

The Jury made no award in this section.

Section A. 5.—In Woods and other Vegetable Substances.

The following Prize Medals were awarded in this section :—

To Mr. C. GEERTS, of Louvain, for his high relief in wood, representing the Coronation of the Virgin Mary. (Belgium, No. 450.)

To M. J. LIÉNARD, of Paris, for his carvings in wood. (France, No. 1326.)
The Jury were aware that the merits of Mr. Liénard had been acknowledged by another Jury. (Council Medal, Class XXVI.)

* This object is not in the Catalogue.



GROUP OF AMAZONS.
(MARBLE)

ENGEL.

To Mr. W. G. ROGERS, of London, for his cradle, carved in Turkey boxwood. (No. 353.)

To Mr. T. W. WALLIS, of Louth, for his carvings in wood. (No. 89.)

Section A. 6.—In Animal Substances, as Ivory, Bone, Shells.

The Jury were of opinion that the following artists were deserving of Honourable Mention :—

M. L. BIGOTTI, of Lucca, for his bas-reliefs in ivory. (Tuscany, No. 78.)

M. M. HAGEN, of Munich, for his goblet of carved ivory. (Bavaria, No. 83.)

M. C. W. HEYL, of Darmstadt, for his goblet of carved ivory. (Hesse, No. 75.)

M. C. G. KLINGSEY, of Copenhagen, for his ivory jewel-casket, ornamented with bas-reliefs. (Denmark, No. 34.)

M. L. LAUTZ, of Paris, for his ivory carving, representing the victory of Charlemagne over the Saxons. (France, No. 295.)

Mr. R. C. LUCAS, of the Firs, near Winchester, for his ivory carvings. (No. 306.)

DIVISION B.—WORKS IN DIE-SINKING, INTAGLIOS.

Section B. 1.—Coins, Medals, and Models of a Medallie character in any material.

The following Prize Medals were awarded in this section :—

To M. K. FISCHER, of Berlin, for medals. (Prussia, No. 281.)

To Mr. L. C. WYON, of London, for his medals and medallion portraits of the Royal Children, modelled by command of Her Majesty. (No. 286.)

The Jury were of opinion that the following artists were deserving of Honourable Mention :—

M. BERNARD AFINGER, of Berlin, for his medallions. (Prussia, No. 309.)

M. L. J. HART of Brussels, for his medals. (Belgium, No. 441.)

M. C. JEHOTTE, of Liege, for his medals. (Belgium, No. 447.)

M. C. PFEUFFER, of Berlin, for his medals. (Prussia, No. 286.)

Count T. TOLSTOY, of St. Petersburg, for his medallions. (Russia, No. 328.)

The Jury having the honour to number Mr. W. Wyon, of London, among their members, were prevented from expressing, by their award, the opinion which they entertain of the works exhibited by this distinguished artist.

Section B. 2.—Impressions struck from Dies for Ornamental purposes.

The Jury made no award in this section.

Section B. 3.—Gems, either in Cameo, or in Intaglio, Shell Cameos.

The Jury were of opinion that the following artist was deserving of Honourable Mention :—

M. THOMAS SAULINI, of Rome, for his shell cameos. (Rome, No. 24.)

Section B. 4.—Seals, &c.

The Jury made no award in this section.

DIVISION C.—ARCHITECTURAL DECORATIONS.

Section C. 1.—Integral, in Relief, Colour, &c.

The Jury were of opinion that the following artist was deserving of Honourable Mention :—

Mr. N. J. COTTINGHAM, of London, for his model of a spandril for Hereford Cathedral. (Main Avenue West, No. 63.)

Section C. 2.—Adventitious, as Stained Glass, Tapestry, &c.

The following Prize Medals were awarded in this section :—

To M. G. BERTINI, of Milan, for a painted glass window, representing Dante and some of his ideas. (Austria, No. 737.)

To M. A. GÉRENTE, of Paris, for his painting on glass of the history of Samson. (France, No. 231.)

To Messrs. J. HARDMAN and Co., of Birmingham, for their painted glass windows. (Class XXVI., No. 532.)

To M. S. KELLNER, of Nuremberg, for a copy in painted glass of a window by Volkamer, in St. Lawrence's church in that city. (Bavaria, No. 86.)

To Messrs. MARECHAL and GUYNON, of Metz, for their painting on glass, representing St. Charles administering the Communion to the plague-stricken. (France, No. 329.)

The Jury were of opinion that the following artists were deserving of Honourable Mention :—

M. P. BAGATTI-VALSECCHI, of Milan, for his painting on glass. (Austria, No. 616.)

Messrs. CHANCE BROTHERS, and Co., of Birmingham, for their painted window-glass. (Class XXIV., No. 60.)

Messrs. HOLLAND and SON, of Warwick, for their life of Christ painted on glass. (Class XXIV., No. 63.)

Mr. J. G. HOWE, of London, for his imitation of ancient painted window-glass. (Class XXIV., No. 67.)

M. A. LUSSEN, of Paris, for his painted glass window. (France, No. 565.)

Mr. GEORGE MYERS, of London, for the tomb in stone of Bishop Walsh. (Class XXVI., No. 533.) (Prize Medal, Class XXVII.)

Messrs. M. and A. O'CONNOR, of London, for their painted glass. (Class XXIV., No. 65.)

The Jury gladly seize the opportunity which now offers itself of rendering justice to the taste displayed by their colleague Mr. Pugin in the arrangement of the Mediæval Court in the Exhibition.

Mr. W. WAILES, of Newcastle-upon-Tyne, for his painted glass for York Cathedral. (Class XXIV., No. 73.)

To the GOVERNMENT MANUFACTORY OF GOBELINS AND BEAUVAIS TAPESTRY the Jury award a Council Medal jointly with Class XIX.

DIVISION D.—MOSAICS AND INLAID WORKS.

Section D. 1.—In Stone.

The following Prize Medals were awarded in this section :—

To the CAVALIERE BARBERI, of Rome, for a mosaic table, designed and executed

by him, representing views of celebrated cities in Italy. (Rome, No. 15. Council Medal, Class XXVII.)

To Mr. G. BIANCHINI, of Florence, for his tables in pietra dura, one of them exhibited by R. S. Holford, Esq., and not entered in the Catalogue, the other entered (Tuscany, No. 113). The Jury were much pleased to learn that the merits of this distinguished artist, with respect to the second table, had been suitably acknowledged by another Jury. The table described under No. 111, in the same page of the Catalogue, has not been exhibited.

To M. RAFFAELLE CASTELLINI, Royal Manufactory of St. Peter's, Rome, for his copies in mosaic of a medallion portrait of Boniface II., by Bompiani, and of the head of St. John the Baptist, by Guercino. (Rome, No. 23.)

The Jury were of opinion that the following artists were deserving of Honourable Mention :—

M. BENEDETTO BOSCHETTI, of Rome, for two mosaic tables. (Rome, No. 17. Prize Medal, Class XXVII.)

M. DOMENICO MOGLIA, of Rome, for his mosaics. (Rome, No. 21. Honourable Mention, Class XXVII.)

The CAVALIERE LUIGI MOGLIA, of Rome, for his mosaic view of the Temples of Pæstum. (Rome, No. 20. Prize Medal, Class XXVII.)

M. ANTONIO ROCCHIGIANI, of Rome, for his mosaic view of the Temples of Pæstum. (Rome, No. 22.)

Section D. 2.—In Tiles.

The Jury made no award in this section.

Section D. 3.—In Vitrified Materials.

The Jury made no award in this section.

Section D. 4.—In Wood.

The following Prize Medal was awarded in this section :—

To MM. PEREZ and Co., of Barcelona, for an octagonal table of inlaid wood. The Jury have heard with pleasure, that the distinguished merits of this work have been suitably acknowledged by another Jury. (Spain, No. 271A.)

Section D. 5.—In Metal.

The following Prize Medals were awarded in this section :—

To M. J. FALLOISE, of Liege, for various inlaid objects. (Belgium, No. 384. Prize Medal, Class XXIII.)

To M. J. ROUCOU, of Paris, for his inlaid work. (France, No. 1689.)

The Jury were of opinion that the following artists were deserving of Honourable Mention :—

Messrs. S. H. and D. GASS, of London, for a niello bracelet, designed by Mr. Maclise. (Class XXIII., No. 83.)

The ROYAL ORDNANCE MANUFACTORY, of Toledo, for various inlaid arms. (Spain, No. 266.)

M. E. ZULOAGA, of Eibar, for his inlaid ornaments on pistols and other arms. (Spain, No. 264A. Prize Medal, Class XXIII.)

DIVISION E.—ENAMELS.

Section E. 1.—On Metals.

The following Prize Medals were awarded in this section :—

To M. — BONNET (of Paris?) for the head of St. John, in enamel. (France, No. 1369.)

To Mr. W. ESSEX, of London, for his enamel paintings. (No. 241.)

To M. — HAMON, of Paris, for an enamelled casket. (No. 1369.)

To Madame PAULINE LAURENT, of Paris, for her three enamels in copper, two after Raphael, and one representing Venus. (France, No. 1369.)

The Jury were of opinion that the following artists were deserving of Honourable Mention :—

Mr. W. C. BELL, of London, for his enamel painting of the "Ecce Homo," after Correggio. (No. 249.)

Mr. H. P. BONE, of London, for his enamel paintings on gold. (No. 238.)

Mr. J. HASLEM, of London, for his enamel paintings on gold. (No. 237.)

Section E. 2.—On China.

The following Prize Medals were awarded in this Section :—

To M. ANTOINE BÉRANGER, of Paris, for his portrait of Prince Albert, life-size, painted on china, after Winterhalter. (Main Avenue East, No. 97.) Also for a Head, painted by him on china, after Rubens. (France, No. 1369.)

To M. H. BUCKER, of Dresden, for his paintings on china. (Saxony, No. 176.)

To M. J. DIETERLE, of Paris, for the general good taste displayed in the painting of china in the Manufactory of Sèvres, of which he is co-director. (France, No. 1369.)

To Mme. A. DUCLUZEAU, (of Paris?) for her portrait of Her Majesty, life-size, painted on china, after Winterhalter. (Main Avenue East, No. 96.) Also for her painting of a Holy Family, on china. (France, No. 1369.)

To M. JACOBBER, of Paris, for his paintings of flowers on china, after Van Huysum. (France, No. 271.)

To Mme. JACOTOT, of Paris, for the Head of Raphael, painted by her on china. (France, No. 1369.)

To M. N. KORNILOFF, of St. Petersburg, for a landscape after Berghem, on china; executed at the Imperial China Manufactory, St. Petersburg. (Russia, No. 318.)

To M. — SCHILT, of Paris, for his painting on a china vase. (France, No. 1369.)

To M. O. WUSTLICH, of Bamberg, for his portrait of Charles IX. on china. Exhibited by Mr. SCHMIDT. (Bavaria, No. 92.)

The Jury were of opinion that the following artists were deserving of Honourable Mention :—

Mr. — BRADLEY, of Stoke-upon-Trent, for his painting of Ducks on china, exhibited by Mr. COPELAND. (Class XXV., No. 2.)

Mr. S. CHESTERS, of London, for his specimen of painting on china, after Murillo. (No. 246.)

MM. ECKELMANN and WÜSTIAH, for their portraits of the Queen with the Prince of Wales, and of Prince Albert, painted on china from miniatures after Thorburn. (Main Avenue West, No. 140.)

MM. F. E. HENNEBERG and Co., of Gotha, for their paintings on china. (Prussia, No. 772.)

M. MARIETTE DE CHASSAGNE, for a painting on china after Horace Vernet, exhibited by M. Boyer, of Paris. (France, No. 1554.)

M. — NIGG, for a Flower-piece and Holy Family, on china, from the Imperial China Manufactory at Vienna. (Austria, No. 615.)

Mme. TURGAN, of Paris, for her painting on china. (France, No. 1504A.)

Mr. G. WALTHER, of Dresden, for his paintings on china. (Saxony, No. 177.)

Section E. 3.—On Glass.

The Jury made no award in this Section.

**DIVISION F.—MATERIALS AND PROCESSES APPLICABLE TO THE FINE ARTS
GENERALLY, INCLUDING FINE-ART PRINTING, PRINTING IN COLOUR, &c.**

Section F. 1.—Encaustic Painting and Fresco.

The following Prize Medals were awarded in this Section :—

To M. J. DEVERS, of Paris, for a Holy Family in enamel paste, painted on lava. (France, No. 818.)

To M. J. N. VON FUCHS, of Munich, for his specimen of a stereo-chromic method of producing indestructible paintings on walls, exhibited by Mr. Muhr. (Bavaria, No. 91.)

*Section F. 2.—Ornamental Printing, Chromo-Typography, Gold-illuminated
Typography, Typography combined or uncombined with Embossing.*

The following Prize Medal was awarded in this Section :—

To M. G. SILBERMANN, of Strasburg, for his chromo-typography. (France, No. 374.)

The Jury were of opinion that the following artist was deserving of Honourable Mention :—

Mr. J. HARRIS, of London, for his imitations of ancient typography. (No. 244.)

*Section F. 3.—Lithography (Black), Chromo-Lithography, Gold-illuminated
Lithography, Lithography combined or uncombined with Embossing.*

The following Prize Medals were awarded in this Section :—

To Messrs. DAY and SON, of London, for their specimens of tinted lithography and chromo-lithography. (Fine Arts Court, No. 80.)

To Messrs. M. and N. HANHART, of London, for their chromo-lithography in graduated tints. (Fine Arts Court, No. 64.)

To Messrs. HULLMANDEL and WALTON, of London, for their drawings on stone with the stump, and for their lithotints. (Fine Arts Court, No. 71.)

To the IMPERIAL PRINTING OFFICE OF VIENNA, for the "Paradisus Vindobonensis" in chromo-lithography. (Austria, No. 362.)

To Mr. OWEN JONES, of London, for his chromo-lithography. (Fine Arts Court, No. 54.)

To M. R. J. LEMERCIER, of Paris, for his lithography and chromo-lithography. (France, Nos. 587 and 558.)

To MM. WINCKELMANN and SONS, of Berlin, for their coloured lithography. (Prussia, No. 306.)

The Jury were of opinion that the following artists were deserving of Honourable Mention :—

The fac-similes of ancient MSS. and illuminations by Comte AUGUSTE DE BASTARD, of Paris, have been duly appreciated by the Jury. As it appears, however, that the most important parts of the several objects exhibited are finished by the hand, the Jury abstained from a more special inquiry into their merits. (France, No. 1717.)

Mr. G. BAXTER, of London, for his printing in colours. (No. 115.)

M. F. DREGER, of Moscow, for his chromo-lithography. (Russia, No. 362.)

Mr. T. UNDERWOOD, of Birmingham, for a new process of lithography. (Fine Arts Court, No. 77.)

Section F. 4.—Zincography, or other modes of Printing.

The following Prize Medal was awarded in this Section :—

To Mr. R. APPEL, of London, for his anastatic printing. (No. 274.)

The Jury were of opinion that the following artist was deserving of Honourable Mention :—

Mr. J. HANFSTAENGEL, of Munich, for his galvanography. (Bavaria, No. 85.)

To the processes applicable to the Fine Arts generally, belong those employed by the next three Exhibitors, whose claims the Jury of Class XXX. have acknowledged in the following manner :—

Prize Medals were awarded

To Mr. B. CHEVERTON, of London, for his process of reducing sculpture by machinery, as exemplified in the Theseus. (No. 194.)

To M. A. COLLAS, of Paris, for his process of reducing sculpture by machinery, as exemplified in the Gates of the Battisterio at Florence, and other works. (France, No. 1709.)

The Jury were of opinion that the following artist was deserving of Honourable Mention :—

Mr. B. E. DUPPA, of London, for specimens of a new process of executing fine art designs on detached tiles; the design being burnt in on the separate pieces, and then put together. Exhibited by Messrs. H. MINTON and Co. (Class XXVII., No. 51.)

DIVISION G.—MODELS.

Section G. 1.—In Architecture.

The Jury having been directed to include architectural models in the range of their inquiries, were naturally led to reflect upon, and then to feel it a most agreeable duty to acknowledge publicly, the merit of the Building in which they met. The originality of the construction, and the rapidity with which it has been carried to completion would, in comparatively recent times, have induced popular enthusiasm to ascribe to fairy agency the power of overcoming obstacles hitherto considered to be insurmountable by human ingenuity. The noble simplicity of the whole edifice, the striking grandeur of its proportions, the novel and ingenious application of the materials of which it is constructed, and the admirable adaptation of all its parts to their multifarious purposes, gave to the person who conceived it, as well as to those who with so much zeal and success carried out the constructor's design, a right to the highest award in the power of the Jury to recommend. The Jury had, therefore, the honour to propose that a Council Medal be awarded to Mr. JOSEPH PAXTON, and a similar Medal to Messrs. FOX and HENDERSON. And although the Jury had already rendered justice to the claims of Mr. OWEN JONES, by awarding him a Prize Medal for his chromo-lithography, they felt it to be their duty to record here their opinion of the advantages resulting to the Building from the simple and tasteful style of decoration which Mr. Owen Jones has so skilfully suggested and so successfully applied.

The following Prize Medals were awarded in this section :—

To Mr. J. C. BOESCHE, of Magdeburg, for his models of Magdeburg Cathedral and of the Nuremberg Fountain, executed in limewood.. To this artist the Jury have also made a money award of 30*l.* sterling. (Prussia, No. 785.)

To Mr. JABEZ JAMES, of London, for his model in various materials, of the Britannia Suspension Bridge. (Class VII., No. 106. Prize Medal, Class VII.)

To Mr. S. SALTER, of London, for his model executed in card of St. Nicholas' Church, now being rebuilt at Hamburg. (Class VII., No. 221.)

The Jury were of opinion that the following artists were deserving of Honourable Mention :—

M. J. H. CASSEBOHM, of Oldenburg, for his model of Heidelberg Castle, carved in cork. (Oldenburg, No. 1.)

Mr. S. CUNDY, of London, for his restoration of the Monument of Philippa of Hainault, in English alabaster, from drawings by Mr. G. C. Scott. (Main Avenue West, No. 60. Prize Medal, Class XXVII.)

Mr. T. DUNHILL, of London, for his model in plaster, and other materials, of a Metropolitan Cattle Market, with abattoirs, &c. (Class VII., No. 90.)

M. J. LEEMAN, of Berne, for his model of the Nuremberg Fountain, carved in wood. (Switzerland, No. 258.)*

M. J. LEEMAN, of Zürich, for his model of the Cathedral of Strasburg, executed in card. (Switzerland, No. 257.* Prize Medal, Class VII.)

Mr. W. STUART, of Plymouth, for a model of the Plymouth Breakwater, executed in limestone. (Class VII., No. 28.)

* Since the Award Book was closed, it has been ascertained that the two entries No. 257 and 258 refer to the same person.

Section G. 2.—In Topography.

The following Prize Medal was awarded in this section :—

To Mr. JOHN GRANTHAM, Secretary of the Liverpool Local Committee, for a model of the Docks and commercial portion of the Town of Liverpool, in various materials. (Main Avenue West, No. 95.)

Section G. 3.—In Anatomy.

The Jury of Class XXX. abstained from examining models in Anatomy, as such objects were transferred to another Class. (Minute of May 26th, 1851.)

DESIGNS.

The various designs for decoration, tapestry, embroidery, mixed fabrics, &c., not having been submitted to the examination of any other Jury, the Jury of Class XXX. appointed a Committee of their own body, which, together with members of Juries of other Classes, were instructed by the Royal Commissioners to report on the articles thus overlooked. This mixed Committee having reported accordingly, the Jury of Class XXX. proceeded to award the following Prize Medals :—

To MM. BERRUS BROTHERS, of Paris, for their general ability in designs for shawls. The Jury wished, however, to guard themselves from being supposed to approve of the introduction of landscapes in such designs, as exhibited in frames Nos. 1 and 2. (France, No. 55.)

To M. J. CHEBEAUX, of Paris, for his cotton and calico prints apart from their taste. (France, No. 1146.)

To M. C. E. CLERGET, of Paris, for his designs generally, and his exhibited works in ornament. (France, No. 799.)

To M. A. COUDER, of Paris, for his Shawl Designs, and for his skilful execution of his Designs generally, apart from their taste. (France, No. 1566.)

To the GOVERNMENT HEAD SCHOOL OF DESIGN, established in London. (Fine Arts Court, No. 10.)

The mixed Sub-Committee examined the Designs intended for Manufactures, exhibited by this School, directed by Messrs. J. R. Herbert, R. Redgrave, and H. J. Townsend; the female department being superintended by Mrs. M'lan. The Sub-Committee reported that in these designs they had observed a purity of taste, a propriety and chasteness of invention, and a well-understood adaptation of style for the several objects, which do great credit to the directors and to their scholars. The Sub-Committee, therefore (Mr. Redgrave, one of its members and a Juror of Class XXX., having withdrawn), felt it to be their duty to propose to this Jury that a Prize Medal should be awarded to the Institution. They moreover recommended that Honourable Mention should be made of three of the pupils, and that six other pupils, viz., S. ASHWORTH, FLORENCE COLLINS, J. S. CUTHBERT, A. TOWN, J. KYD, and J. RAWLINGS, should be mentioned with much approbation. The Jury of Class XXX., after due inquiry and mature deliberation, approved unanimously of these suggestions, and adopted the whole of these recommendations. The names of the three pupils to whom an Honourable Mention has been awarded will be severally found in their proper place.

To M. E. LAROCHE, of Paris, for his Manufacture Designs. (France, No. 291.)

To LUKE LIMNER, (Mr. Leighton,) for a variety of Designs. (Class XVII., No. 24.)

To Mr. DIGBY WYATT, of London, for good taste generally in his Designs. (Fine Arts Court, No. 30.)

The Jury were, moreover, of opinion, that the following artists were deserving of Honourable Mention :—

Mr. W. ALDRIDGE, a pupil of the Government Head School of Design, for his Designs. (Fine Arts Court, No. 10.)

M. C. BRAUN, of Paris, for his Designs for Calico Prints. (France, No. 72.)

Mr. JOHN CARTER, of Crayford in Kent, for his Designs unapplied.

M. F. DIDIER, of Paris, for his Designs for Shawls. (France, No. 820.)

M. N. A. GALIMARD, of Paris, for his Designs for Painted Glass. (France, No. 228.)

M. — GRUENTHAL, of Berlin, for his Patterns for Berlin Wool. (Prussia, No. 166.)

Mr. J. K. HARVEY, of London, for his Designs for Carpets. (Class XIX., No. 197.)

Mr. B. HEALD (Class XIX., No. 269), of the Government School of Design, at Nottingham, for his Lace Designs. (Prize Medal, Class XIX.)

Mr. EDWIN IRELAND, a pupil of the Government Head School of Design, for his Designs. (Fine Arts Court, No. 10.)

Mr. J. H. MÉREAUX, of Paris, for his Designs for Lace Manufacturers. (France, No. 631. Prize Medal, Class XIX.)

M. — MEYNIER, of Paris, for his Designs for Shawls. (France, No. 638.)

MM. NAZE and Co., of Paris, for their Designs for Cotton Prints. (France, No. 625.)

M. E. PICARD, of Rouen, for his Designs for Woollen, Cotton, and other Printing. (France, No. 347.)

Mr. C. P. SLOCOMBE, a pupil of the Government Head School of Design, for his Designs. (Fine Arts Court, No. 10.)

Mr. G. TRUEFITT, of London, for his Design of a wrought-iron canopied Tomb. (Fine Arts Court, No. 75.)

The Jury of Class XXX. having brought their labours to a conclusion, cannot refrain from expressing their hope that steps may be taken for rendering the Great Exhibition as useful after it has ceased to be, as it has proved gratifying and instructive in the course of its short existence. It is the wish to see these hopes realized, that impels the Jury, even at the risk of overstepping the strict limits of their functions, to submit, with great deference, their views on this point to the Royal Commissioners.

The foundation of a permanent industrial Museum in the heart of the metropolis of trade and industry, seems to the Jury the logical and practical consequence of this Exhibition. It is in the "Crystal Palace" that the great truth has been impressed upon us that art and taste are henceforth to be considered as elements of industry and trade of scarcely less importance than the most powerful machinery. It seems also natural that this Museum should in the first instance consist of the objects to which the several Juries have called public attention as happy

types and models for imitation. While such a Museum on the one hand would be a lasting depository of industry and of the arts, it would, on the other, serve as the best and easiest standard of comparison by which human ingenuity might mark its progress, on the opening, ten years hence, of a new Great Exhibition ;— it would serve alike as a guide and as a beacon.

Thus the Great Exhibition of 1851, which already stands out so prominently in the past, would bear fruitful and lasting consequences for the future, and would acquire an additional claim to a grateful record in the annals of mankind.

The Greeks, our masters in the nobler arts, did not trust to the historian and the poet alone for the record of their achievements, but committed to the greatest artists the task of immortalizing their military triumphs. The Great Exhibition deserves to be celebrated as the triumph of industry and invention over commercial routine and international jealousies. Whether the "Crystal Palace" shall be removed or not, posterity will look for some mark of gratitude to the illustrious Prince to whom the present generation owe the realization of a gigantic thought ;—a thought which may have floated in the minds of others, but which received consistency, and was brought to maturity by his energy and perseverance.

The Jury of Class XXX., therefore, hope that on the site of the Exhibition Building a statue will be erected to Prince Albert. On its base should be recorded the share which statesmen and others have borne in bringing such an undertaking to completion. The Fine Arts would thus be called upon to perpetuate the memory of the Great Exhibition, to the attractions of which they have so variously and so powerfully contributed.

A. PANIZZI, *Reporter.*

London, September 1851.



GREEK HUNTER.

GIBSON.

CLASS XXX.

SUPPLEMENTARY REPORT.

THE Exhibition of the Works of all Nations in the Crystal Palace had for its primary and essential object the display of whatever could be characterized as a production of Industry. It comprehended every kind of unwrought material, no less than the most ingenious results of machinery or the most exquisite examples of handicraft. But this complete and absolute recognition of industry as the purpose of the Exhibition did not, in the view of the Royal Commissioners, preclude from admission the productions of the Fine Arts; Painting alone being excepted, because, being but little affected by material conditions, it seemed to rank as an independent art. It was not without reason that such a course was adopted, when we consider how greatly, on the one hand, Architecture and Sculpture depend in the execution of their details on mechanical dexterity, and, on the other, how intimately the Fine Arts are connected with many branches of manufacture. So closely, indeed, do their provinces border on those of certain other arts, that it is often difficult to decide in what rank or class objects should be distributed, in the production of which industry and taste have been jointly employed.

This is most strikingly apparent in the case of jewellery and other works in the precious metals, works in bronze, iron, zinc, porcelain, glass, terra cotta, and also in every description of furniture; but it is not less true of carpets, tapestries, and embroidered and coloured stuffs, in all which the taste and beauty of the design depend upon the manner in which the material has been treated and its special conditions observed.

In the great markets of the world the preference will invariably be at once given to those productions which combine, with other indispensable requisites, the recommendation of good taste in their design and treatment.

Among the many good results which we may venture to anticipate from this Exhibition, it may not be too much to hope for a fuller revival of that happy alliance between the Fine Arts and Industry which subsisted in the middle ages, when the artist was more of a craftsman—the craftsman more of an artist—than is the case at present.

Indeed, even in our own day, such a system of co-operation has been established with regard to one object, the technical application of materials; and of the signal results thus obtained, many striking examples may be cited from the Exhibition.

Among these may be mentioned the wonderful specimens of casting in bronze, iron, and zinc; an art which, as regards the two latter metals, has only been brought to perfection in a recent period.

To the present age are also due two most valuable and original inventions, by which works of sculpture may be reproduced, in the one case by means of Galvanoplastic deposit; in the other, by the mechanical processes of M. Collas, in France, and of Mr. Cheverton, in England. The cheapness with which the noblest works

of art can be multiplied by means of these inventions cannot but tend to the more general development of a feeling for the beautiful. Such then are some of the results of the connexion between Industry and the Fine Arts.

But it was not only on account of their intimate association with the interests of Industry that the Fine Arts had a claim to be admitted into the Exhibition; their presence there, as was anticipated by the enlightened views of the Royal Commissioners, conduced essentially to the impressiveness of the general spectacle. It was the variety and beauty of the works of art that lent to the scene its peculiar grace and charm.

In this Report the objects contributed by the several nations will be considered in succession, commencing with Great Britain.

In the survey of each nation, its productions will be noticed in the following order:—

A. SCULPTURE AND WORKS OF PLASTIC ART—

1. Sculpture on a large scale, and in various materials, whether marble, metal, or wood.
2. Sculpture and its varieties on a small scale, in metal, "biscuit," ivory, wood, precious stones, shells.

B. GRAPHIC REPRESENTATIONS ON PLANE SURFACES—

1. New processes of painting.
2. Enamels on porcelain or metal.
3. Painting on glass.
4. Mosaics.
5. Designs for woven and printed stuffs.
6. Various processes of printing, such as lithography, lithochromy, zincography.

C. ARCHITECTURAL DESIGNS—

1. The Exhibition Building.
2. Architectural and other models.

THE UNITED KINGDOM.

From the first introduction of the Fine Arts in this country to the present day, they have received little or no notice from the Government as such: their encouragement, like that of many other important objects, has been left to the public. The foundation of the Royal Academy itself is of comparatively recent date, and the institution is self-supported. The collection of sculpture and antiquities in the British Museum, and that of painting at the National Gallery, have been formed only within the last half century, and many of their most valuable treasures are donations or bequests of private individuals. Before the building of the New Houses of Parliament, the distinguished artists of this country had rarely been employed by the Government on works of a Monumental character, and such commissions were, from their nature, not the objects of private munificence. This is one principal cause why, in the English school of painting and sculpture, no true Monumental style has been as yet formed.

Again, it was only in the year 1836, that the Schools of Design were formed;

institutions by means of which the Fine Arts have exercised a most beneficial influence on the vast productive energy of Great Britain. Much improvement in every branch of industry has been accomplished by means of these schools, but it must be acknowledged that in many kinds of manufacture the English productions, both in regard to their form and colour, show far less taste than those of other nations.

Both the Government and the nation, however, are now becoming conscious of the great importance of art, not only in its Monumental character, but in its relation to Industry.

The vast range of comparison which the Exhibition has afforded, by the juxtaposition of the products of so many nations, has directed the English mind to more enlightened views; and, from the energy of the national character and institutions, these newly awakened ideas may ultimately prove of the greatest benefit in regard both to the Fine Arts and the Manufactures of the country.

A. SCULPTURE AND WORKS OF PLASTIC ART.

1. *Sculpture on a large scale.*

No other nation has exhibited so many works of this class as Great Britain. This may be partly accounted for by the fact, that the English sculptors have not been embarrassed, like those of other countries, by the cost of transporting their works from a distance; but the far greater wealth of the English, as compared with other nations, is another cause of this numerical superiority.

With regard to the quality of their sculpture, it must be confessed that the productions of the modern English school, till within a comparatively recent date, have not been such as to command the approbation of the most competent judges.

In the earlier periods of English art, the name of Flaxman stands alone; and, fertile as this great genius was in invention, the execution of his works hardly equals the beauty of their conception.

His influence seems to have been scarcely felt for a considerable period: the strong tendency to Realism* in the English school of sculpture found its natural expression in portraiture. Chantrey, long pre-eminent among his contemporaries, produced a great number of admirable busts; but in all the works of this period which have a higher pretension, and claim to rank as Ideal sculpture, there is a striking deficiency, not only in scientific knowledge, but in taste and in genuine Plastic style.†

* A work is called Realistic when the artist restricts himself to the task of rendering an individual model in all its parts, form, character, and the like, just as they appear before him. On the other hand a work of art is called Ideal when the artist modifies the figure in these same respects, according to his own feeling for its inner significance and outward beauty of form—attributes which necessarily vary in each case.

† When we say of a work of sculpture that it possesses "style," the following qualities ought to be implied. The sculptor must have so treated the solid material, such as stone, metal, wood, with which he has to deal, as not to remind the spectator of the nature of the substance employed, but so as rather to suggest to the eye the character of the object imitated, flesh, drapery, or whatever it may be.

Further, as we learn from the antique sculpture, in the treatment of naked surfaces, the muscles should not be represented by prominences so isolated and abrupt as to impair the general breadth, but should be rather indicated by moderate depressions in broad surfaces.

To this general criticism, E. H. Baily, in his best works, forms a distinguished exception. Among these, however, we can hardly reckon the three statues in the Exhibition, of a Hunter, a Young Girl, and Eve; of the latter a cast in zinc only was exhibited. But the merit of these works was not overlooked by the Jury, who have awarded them a Prize Medal. (Cat., p. 8, Nos. 6 and 7.)

Since the period referred to, a new race of sculptors has arisen in England, who possess in a remarkable degree the qualities in which their predecessors were deficient. Among the chief causes which have combined to produce this school may be reckoned the influence of the genius of Flaxman, the study of the noblest examples of Greek art preserved to us in the Elgin marbles, and the example of the great Thorwaldsen, with whom many of the English sculptors at Rome had constant intercourse.

Among the most distinguished of contemporary sculptors we may specially mention the name of Gibson. In his *Hunter and Dog*, a lively and imaginative conception is combined with an exquisite feeling for harmony of lines, and with thorough knowledge. The treatment is strictly Plastic; the details carefully and conscientiously wrought out. The unanimous award of the Jury would have bestowed the Council Medal on this work had not the artist been disqualified from receiving a prize by filling the office of a Juror in this Class.

Next should be mentioned the name of Mr. RICHARD J. WYATT, whose death, in the full maturity of his powers, we have to deplore.

His statue of *Glycera* represents a girlish figure, slight and full of simple grace; the characteristics of feminine beauty are indicated in the modelling with great delicacy; the drapery is treated with good taste, and with a due regard for style. One feeling pervades the whole design, and imparts to it a peculiar charm. This work, therefore, united all those qualities which entitled it to receive a Council Medal. (Cat., p. 11, No. 103, second improved edition.)

The following sculptors are well worthy to rank next to the distinguished names already noticed:—

J. H. FOLEY, of London. A *Youth at a Stream*: of this a cast in plaster, and another in bronze, were exhibited. The figure is about to plunge into a river;

In drapery, again, to attain the same general breadth of effect in the larger surfaces, which are supposed to be defined by the forms and action of the body, the details of the folds should be represented not by big, heavy projections, but by numerous contiguous channellings or markings.

The sculptor must, moreover, take care not to attempt, in every part of his work, as perfect an imitation as the nature of the solid material he employs would admit, but he should adopt a treatment more and more conventional in proportion as the object he has to represent is less and less important, flesh being the most important; for otherwise the degree of illusion sought for in the imitation of flesh cannot be attained, because the imitation of many subordinate objects can be carried much further in the solid material with which the artist has to work. In sculpture "in the round," it is also necessary that the centre of gravity be so observed as to suggest to the spectator the idea of solidity and security. In reliefs, lastly, this rule is to be followed,—that, whether the work be in high, middle, or low relief, no single portion should project beyond the extreme limit of general relief in each case intended, but that the whole profile of the relief should be restricted within a given scale; that, again, there should not be more than two distances in the composition, so that two figures at the most can stand one behind the other; to attempt greater depth is to invade the province of picturesque composition, and by destroying the idea of relief from an actual plane, to cause indistinctness of outline.



NYMPH PREPARING FOR THE BATH.
(PLASTER)

BAILY.

YOUTH RESTING AFTER THE CHASE.
(PLASTER)

BAILY.



GLYCERA.
(MARBLE)

WYATT.



YOUTH AT A STREAM.
(PLASTER)

FOLEY.



INO AND BACCHUS.
(PLASTER)

FOLEY.



HAMPDEN.

FOLEY.



THE EAGLE SLAYER.
(BRONZE)

BELL.



LORD FALKLAND.

BELL.



CUPID. EVE. GIRL AT PRAYERS.

MACDOWELL.



SABRINA.
(MARBLE)

MARSHALL.



BOY AND LIZARD.

SHARP.

he still clings to the branch of a tree rising over his head, whilst he advances one foot somewhat timidly. The motive is remarkable for originality and grace, and the conception is well sustained by the whole treatment; in the slender proportions, and finely modelled well-turned limbs, the artist has admirably expressed the attributes of youthful beauty. Another of his works represents a group of Ino and the infant Bacchus, in plaster. Ino, reclining at her ease, holds up to the infant god a bunch of grapes, towards which he eagerly stretches his hands. There is a sprightly grace in the attitude of Ino, and much refinement of form; but on the whole this group is not so simple in conception as the Youth at the Stream; the Prize Medal has, therefore, been awarded to the two works conjointly. In his statue of Hampden (in plaster), executed for the new Houses of Parliament, the same artist has shown that he can unite the peculiarities of individual life, and the details of costume necessary in an historical portrait, with a true Plastic style. (Cat., p. 9, No. 47, p. 155, No. 19.)

J. BELL, of London. The Eagle-slayer, cast in bronze, and also in iron. This figure represents a powerful man in very strong action, at the moment after shooting an arrow into the air. The violence of the exertion has brought the muscles into full play. The artist has admirably succeeded in expressing the momentary and transient character of the action, and the form is modelled with a knowledge and truth of detail which are seldom found in the English school. His work has, therefore, obtained the Prize Medal. (Cat., p. 9, No. 53.)

In the statue of Falkland (in plaster), executed for the new Houses of Parliament, the same sculptor has displayed a mastery rarely attained in portraiture; the conception is very spirited, the treatment throughout strictly Plastic; the figure is remarkable for its noble presence, and its attitude of calm and dignified repose. (Cat., p. 9, No. 28.)

The following artists also exhibit, in their styles, the application of just principles of art:—

P. MACDOWELL, of London. The most remarkable work of this sculptor is his Eve (in plaster). This figure is modelled with great knowledge, the attitude is graceful, and the expression of longing curiosity well rendered. We may also mention his Girl at Prayer (in marble), a figure treated with simplicity and depth of feeling, and very carefully executed. His marble figure of Cupid has also considerable merit. Prize Medal. (Cat., p. 8, Nos. 22, 23, 24.)

W. CALDER MARSHALL. The Sabrina of this artist is remarkable for the feminine grace of the motive, the head has a fine character of individuality, and there is great beauty in the form and in the general expression: in marble. Prize Medal. (Cat., p. 155, No. 15.)

T. SHARP, of London. A Boy stretched on the ground, looking round in alarm, as if startled at a lizard. This is a remarkable work—quite unlike, in choice and treatment of subject, any which has been as yet noticed in this Report. The artist has not hesitated to express that dryness and meagreness of form which characterizes the particular stage of boyhood here selected for representation; but these details are rendered with the utmost accuracy, and with an admirable feeling for nature. The eye of the ordinary observer, habitually accustomed to the specious effect of mere smoothness of surface, may, in some degree, be repelled by this truthfulness of representation; but, like all other truth, it will not the less be

ultimately appreciated, and we may regard this figure as in itself a proof, how great an effort the English school of sculpture is making in the right direction. Prize Medal. (Cat., p. 155, No. 20.)

J. HOGAN, of Ireland. A drunken Satyr, gorged with new wine, which has distended all his veins and muscles, makes a last effort to save himself from falling. This work contains evidence of careful study, but the attitude has something violent and ungraceful : in plaster. Prize Medal. (Cat., p. 155, No. 14.)

B. JENNINGS, of London. In his marble figure of Cupid this artist has been very happy in the representation of youthful form. (Cat., p. 155, No. 81.)

The same may be said of the Arethusa of E. THRUPP, of London, a recumbent figure leaning on one elbow, though there is rather a want of life and individuality in the features. A Boy catching a Butterfly, by the same artist, is a carefully executed and attractive work : in marble. (Cat., p. 155, Nos. 56 and 58.)

A Nymph bathing, by J. LAWLOR, of London, also deserves notice here : in marble. (Cat., p. 155, No. 22.) All the three last-mentioned works have obtained Prize Medals.

The portrait statue of Flaxman, by the late M. L. WATSON, of London, shows how greatly this artist excelled in Iconic Sculpture. The figure, which is executed out of a very beautiful block of marble, is seated ; the general attitude is remarkably true to nature, the head full of intelligence, and the whole design is worked out with great spirit, and with conscientious labour. The colossal seated figures of Lord Eldon and Lord Stowell, by the same artist, are also remarkable specimens of the same class of sculpture, though not equal in merit to the statue of Flaxman. The hands appear too large : in marble. Prize Medal. (Cat., p. 155, No. 60, and p. 9, No. 81.)

L. MACDONALD, of Rome. The iconic figure by this sculptor, executed in the manner and costume of classical antiquity, shows that the artist has a just perception of style and sound knowledge : in marble. Prize Medal. (Cat., p. 295, No. 18.)

In conclusion may be noticed the following artists, as deserving the Honourable Mention bestowed on them by the Jury :—

W. BEHNES, of London, for his Nymph startled by a Lizard : in marble. (Cat., p. 155, No. 54.)

W. THEED, of London, for his marble group of the Prodigal Son embraced by his Father, and for his Narcissus, also in marble. (Cat., p. 155, Nos. 13 and 59.)

H. WEEKES, of London, for his Sleeping Child with a Dog : in marble. (Cat., p. 8, No. 21.)

E. B. STEPHENS, of London, for his Deer Stalker and Dog. (Cat., p. 8, No. 29.)

F. M. MILLER, of London, for Two Orphan Children at Prayer : marble. (Cat. p. 11, No. 98A, second improved edition.)

Mr. and Mrs. T. THORNYCROFT, of London, for the Royal Children, in the characters of the Four Seasons : in plaster. (Cat., p. 155, No. 34.)

G. MYERS, of London, for the Tomb of Bishop Walsh, in stone ; a monument in which the ecclesiastical style of the middle ages is well sustained, not only in the principal figure, but also in the accessories. Prize Medal. (Class XXVII., Cat., p. 136, No. 533.)

To this list the name of HANCOCK deserves, in my opinion, to be added, for his



DRUNKEN FAUN.
(PLASTER)

HOGAN.



CUPID.
(MARBLE)

JENNINGS.



ARETHUSA.
(MARBLE)

THRUPE.



BOY AND BUTTERFLY.
(MARBLE)

THRUPP.



A BATHER.
(MARBLE)

LAWLOR.



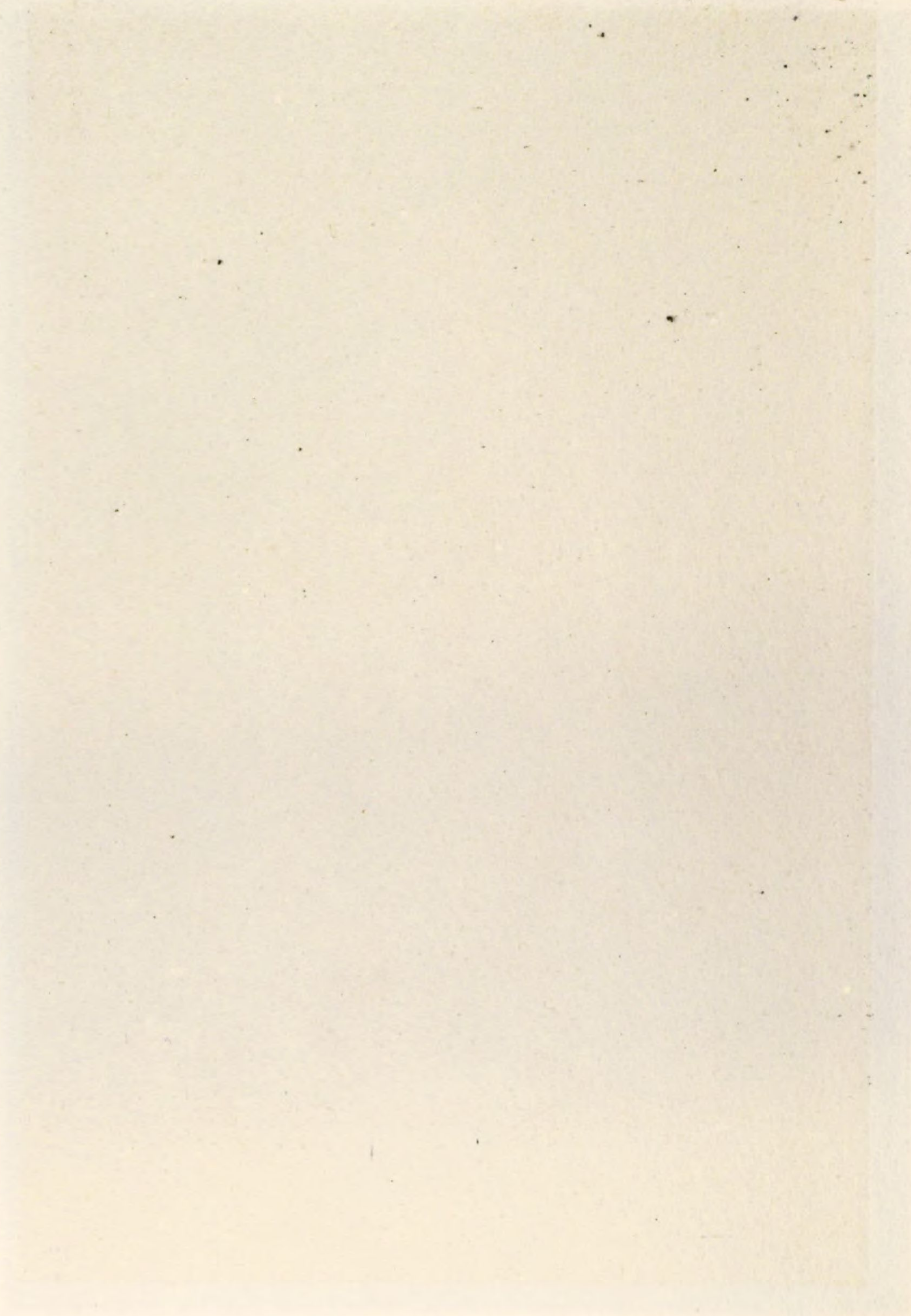
ELDON AND STOWELL.
(MARBLE)

WATSON.



FLAXMAN.
(MARBLE)

WATSON.





ICONIC STATUE.
(MARBLE)

MACDONALD.

statue in plaster of the Beatrice of Dante, in her beatified state. The figure is distinguished by a pure and noble expression of the head, although many defects may be remarked in the drapery. (Cat., p. 8, No. 25.)

In concluding this notice of English sculpture, it is right to mention that several highly distinguished artists have not contributed any works to the Exhibition.

2. *Sculpture and Works of Plastic Art on a small Scale.*

To this branch of English art the remarks already made on sculpture on a large scale are generally applicable. Even at the present day many of the most distinguished artists who have executed and exhibited works of this class are foreigners.

1. *Works in Metal.*

(a.) *Embossed (Repoussé) Work.*

A. VECHTE, of France, at present settled in England. The works of this artist in strictness belong to Class XXIII. (jewellery and goldsmiths' work), but they are so essentially and exclusively productions of Fine Art, that it is impossible to pass them over without mention in this Report. They consist of a shield as yet unfinished, and a vase representing the contest between Jupiter and the Giants, executed in silver for the great establishment of Messrs. Hunt and Roskell at Birmingham. These works show that no living artist has so fully entered into the spirit of the Italian style of the sixteenth century, commonly called the *Cinque Cento*, as Vechte. He has also exhibited a shield, which, having been executed in France, is therefore in the French Department. In its design the artist has harmonized with great skill two celebrated compositions of the Murder of the Innocents, that by Raphael—preserved to us in the engraving by Marc Antonio, and in the tapestry of the Vatican,—and that known to us in the picture by Nicolas Poussin. Honourable Mention. (Cat., p. 124. No. 97.)

J. V. MOREL and Co., of Paris, now settled in London. This firm exhibit a set of cups, made of different kinds of precious stones, decorated with small figures, animals, masks, and other ornaments, exquisitely wrought in gold and silver, and in enamel, the whole executed in the feeling of Benvenuto Cellini, and with the same refined taste. In the expression of the heads only there appears a somewhat too modern sentiment. The talent displayed in these works is so remarkable, that though they belong strictly to Class XXIII., where they have been rewarded with a Council Medal, they cannot be passed in silence here. (Cat., p. 125, No. 117.)

(b.) *Medals and Coins.*

W. WYON, of London, Chief Engraver of the Mint.* This artist is certainly one of the most distinguished of his class in the present day. He is endowed with a just perception of nature, and a refined sense of beauty in form and movement. His works are executed in mezzo-relievo, in that style which alone is admissible in Numismatic Art, and which he has brought to great perfection. Both the Medals, and the enlarged models of Medals, which he has exhibited, fully bear out these remarks. But I would particularly call attention to his models of the heads of

* This notice was written a few days before the death of the distinguished artist to whom it relates.

Her Majesty and His Royal Highness the Prince Albert, for the obverse of the Prize Medal of the Exhibition. His office of Juror alone disqualified him from receiving a prize. (Cat., p. 153, No. 284.)

L. C. WYON, of London. This young artist is a worthy inheritor of his father's talent. His portraits of the children of Her Majesty and that of His Royal Highness Prince Albert, as well as his model for the reverse of the Prize Medal, are executed in a very good style, and the whole is wrought out with the earnestness of a labour of love, as well as with great simplicity and feeling for nature. Prize Medal. (Cat., p. 153, No. 286.)

2. *Works in Ivory.*

R. C. LUCAS, of the Firs, Winchester. This artist has executed with great fidelity copies of several of the most celebrated antique works in the British Museum, such as the bronzes of Siris, the supposed head of Proserpine on the medallions of Syracuse, and the admirable carving in hone-stone by Albert Durer, representing the Birth of Saint John the Baptist, also in the British Museum. Honourable Mention. (Cat., p. 153, No. 306.)

3. *Works in "Biscuit."*

MINTON and Co. The productions of this great porcelain manufactory properly belong to Class XXV., and have there been rewarded with a Council Medal; but so many of them deserve to rank as examples of Fine Art, that I think it right to mention them here. I would particularly notice the copies of the celebrated silver cups in the Museo Borbonico at Naples, with groups of centaurs in relief, the copy of the Farnese Flora, and also two friezes. The establishment deserves the greatest praise for these productions, by means of which the finest models of Art are circulated, and a correct taste more widely diffused. (Cat., p. 128, No. 1.)

The same laudable endeavour to spread the knowledge of Art is apparent in the manufactures of COPELAND, CHARLES MEIGH and SON, and JOSIAH WEDGWOOD and SONS. The manufactory of BELL and Co., at Glasgow, deserves especial notice, on account of the judgment generally displayed in their choice of forms from the antique. The more sparing use of gold as an ornament distinguishes these works from those of most other English manufactories.

4. *Carvings in Wood.*

Wood carving was from a very early period much esteemed by the English, and has been diligently cultivated among them. An extraordinary number of specimens, not only in the Gothic and Renaissance styles, but in the "Rococo taste" of the last century, have been contributed to the Exhibition, and many of them are of the greatest merit. Though the greatest part of these specimens are articles of furniture, and therefore belong to Class XXVI., yet among them are two of such high artistic merit, that I cannot omit a passing notice of them here. These are—(1.) A large sideboard, exhibited by COOKE and SONS, of Warwick. (2.) A bookcase in the style of the Renaissance, by HOLLAND and SONS, of London.

Among the wood carvings which may be considered purely as works of Fine Art are—(1.) Those of T. W. WALLIS, of Louth, in Lincolnshire. This artist has represented various kinds of dead game with a true feeling for nature, and with



MEDALLION PORTRAITS OF THE ROYAL FAMILY. WYON.



CRADLE CARVED IN BOXWOOD.

ROGERS.

an extraordinary mastery in every kind of detail. He is also entitled to the greatest praise for his carving of a mass of vine-leaves, which is executed with the most minute and scrupulous imitation of nature, without losing the characteristics of a true Plastic style. Prize Medal. (Cat., p. 149, No. 89.)

W. G. ROGERS, of London. A cradle executed in box-wood for Her Majesty Queen Victoria, and richly ornamented with carved reliefs; also, a group of musical instruments, among which may be especially noticed a violin. These works show an extraordinary dexterity in the treatment of the material, and the ornaments of the cradle are in excellent taste. Prize Medal. (Cat., p. 154, No. 353.)

In concluding this notice of works of sculpture of the United Kingdom, I must mention the machine invented by Mr. B. CHEVERTON, of London, for the reproduction, either on the same or on a smaller scale, of works of sculpture. The figure commonly known as the Theseus, in the Elgin collection of the British Museum, has been reduced by this process in alabaster, for the purpose of casting in plaster, with an accuracy which leaves the most fastidious critic nothing to desire.

The benefit which all lovers of Art, and more particularly artists themselves, will derive from this discovery, are so obvious, that I need not further insist on them here. Prize Medal. (Cat., p. 151, No. 194.)

B. GRAPHIC REPRESENTATIONS ON PLANE SURFACES.

1. *New processes of Painting.*

B. E. DUPPA, of London, the inventor of a new mode of monochrome painting on tiles. The painting has all the appearance of a chalk drawing, and is so united with the tile by the action of fire, as to bear any amount of exposure to the weather. Among the specimens exhibited of this process is a head which appears exactly like a drawing in red chalk. Honourable Mention. (Class XXVII., No. 51.)

2. *Enamels on Porcelain or Metal.*

W. ESSEX, of London, exhibits a number of copies of celebrated pictures, such as the so-called "Gevartius" of Vandyke; Joseph and Mary with our Saviour, by Murillo—both in the National Gallery; and a Young Girl, after Sir Joshua Reynolds. In all these copies the drawing, colouring, and general character of the originals are rendered with the utmost fidelity. Other specimens, however, such as the Portrait of Shakspeare, and that of Her Majesty Queen Victoria, are somewhat hard, patchy, and deficient in modelling. These enamels are on metal. Prize Medal. (Cat., p. 152, No. 241.)

S. CHESTERS, of London. The picture by Murillo in the National Gallery, mentioned in the preceding notice, has been admirably copied by this artist on porcelain. Every trait in the original is rendered with the utmost delicacy; this work reflects the highest credit on its author. Honourable Mention. (Cat., p. 152, No. 246.)

Lastly, the following artists may be noticed as fully deserving the Honourable Mention they have obtained: ECKELMANN and WÜSTIAH, for the portraits of the Queen, the Prince of Wales, and of H.R.H. Prince Albert, on a jewel-case belonging to Her Majesty Queen Victoria; HASLEM, for his St. John, after Murillo, and

also for his "Ecce Homo," after Correggio, both which pictures are in the National Gallery; BELL, BONE, and lastly, BRADLEY, of Stoke-upon-Trent, for a duck enamelled on china, and exhibited by Copeland. (Cat., p. 5, No. 140, second improved edition, p. 152, No. 237, p. 152, No. 249, p. 152, No. 238, p. 128, No. 2.)

3. *Painting on Glass.*

In this branch of painting there are two very distinct styles. The one has been principally employed for the decoration of church windows, and being thus intimately associated with architecture, must rigidly conform to its laws. Thus, in this style the general character of the ornament should be Architectonic, the patterns should be very distinct, combining beauty of form with harmony of colouring; there should be great repose in the attitudes of the figures, and the draperies should be in simple masses. The other style of glass-painting attempts to give all the effect of an actual picture, strictly so called, and to heighten this effect by the gorgeousness and transparency of the colour. The former of these kinds of glass-painting is to be regarded as of higher importance, and has more claims to rank as an original art than the latter, which, however, is capable of being made very attractive. But it is of the greatest importance not to mix the two styles. This has been done in many windows executed in the 15th and 16th centuries, in which the artist, abandoning the architectonic laws which ought to be his guide, has attempted those higher artistic effects, which are only to be achieved in other materials, such as oil or fresco, and has consequently fallen very far short of his aim.

Very good works in both kinds of glass-painting were to be seen in the Exhibition, but these must by no means be taken as the best specimens which the art of our age is capable of producing. It is much to be regretted that the Exhibition did not contain any examples either of the ecclesiastical glass-paintings of the Royal Manufactory at Munich, or of the imitation of pictures by Messrs. Boissérée of Bonn; in both of which establishments works have been executed which have hardly been surpassed in the present age. It is right to add that the latter manufactory has judiciously availed itself of artists trained in the establishment at Munich.

It is of the greatest importance in the imitation of ancient glass, which is now so generally attempted, that the characteristics of different periods should be faithfully rendered. The number of churches now built in the Gothic style makes this discrimination of styles all the more necessary. But the study of ancient examples may lead to the perversion of taste, if the artist persist in adhering to the conventional forms of the mediæval styles, and choose to ignore the superior knowledge of drawing of his own day. If, however, the laws above stated be observed, they will be found perfectly compatible with natural forms.

(a.) Ecclesiastical Style.*

J. HARDMAN and Co., of Birmingham. In the window-glass exhibited by this establishment in the Mediæval Court, the true principles of the style have been

* This style of glass-painting might be termed Architectonic, as it is applicable not only to churches, but to many other edifices, civil as well as religious.

faithfully observed; and the execution of the work is very careful. It may be noticed, however, as a defect in these windows, that the glass of the backgrounds between the figures is too transparent; they are consequently inferior in repose and harmony of colouring to the mediæval windows of the best time. Prize Medal. (Cat., p. 136, No. 532.)

CHANCE BROTHERS and Co., of Birmingham. Two Gothic windows, also executed according to correct principles. Honourable Mention. (Cat., p. 127, No. 60.)

The three following artists also deserve the Honourable Mention which they have received: HOLLAND and SON, of Warwick, for their "Life of Christ." (Cat., p. 127, No. 63, second improved edition.) I. G. HOWE, of London, for his imitation of an ancient painted window. (Cat., p. 127, No. 67, second improved edition.) W. WAILES, for the decorative part of his design. The figures are not equal in merit to the rest of the work. (Cat., p. 127, No. 73.)

(b.) Pictorial Style.

M. and A. O'CONNOR, of London. In his "Raising of Lazarus," this artist has been very successful in giving the characteristics of an oil painting; everything is in perfect keeping, and is drawn with great truth and care. In the richness of the colouring, he has turned his material to very good account. Honourable Mention. (Cat., p. 127, No. 65, second improved edition.)

4. *Works in Niello.*

In this kind of art, which received the name of "Niello" work in the middle ages, figures or ornaments are first engraved on a silver plate, and the incised lines are then filled up with a paste compounded of silver, copper, lead, sulphur, and borax. The dark colours so inlaid, contrasting with the bright surface of the silver, produce an effect not unlike that of a print from a copper plate.

This art, which had been for a long time neglected, was revived in the present day with great success by Wagner, a silversmith from Berlin, established at Paris. In the Exhibition was a gauntlet, on which a design by Maclise was engraved in niello, by S. H. and D. Gass, of London. The work is very skilfully executed. Honourable Mention. (Cat., p. 124, No. 83.)

5. *Designs for Printed and Woven Fabrics, for Embroidery, and for Book-covers.*

The primary law of all such designs is, that they must not disturb the flatness of the surface on which they are drawn, but only diversify it with lines agreeable to the eye, and with harmonious masses of colour. Hence no foreshortenings should be attempted in such designs, and all perspective views are to be absolutely rejected, as at variance with the principles of a true style of ornament. It is obvious that the character of the pattern will be essentially affected by the quality of the materials and the purpose for which it is intended. Thus, for instance, shawls, though of a yielding texture, rather follow the movements of the body in a general sense; hence the patterns of shawls should be of considerable size, with soft, flowing outlines. Cottons, on the contrary, and other similar clothing fabrics which cling more to the body, require smaller and more symmetrical patterns.

Mr. DIGBY WYATT, of London, exhibits a considerable number of designs for

various purposes. They are in very good taste, and in perfect accordance with the principles here laid down. Prize Medal. (Cat., p. 148, No. 30.)

JOHN LEIGHTON, jun., of London. The designs for book-covers exhibited under this name have very remarkable merit, from the variety of forms in the patterns, and the happy choice of the colours. Prize Medal. (Cat., p. 91, No. 24.)

C. J. RICHARDSON. Out of the multitude of designs exhibited by this artist, some show a good taste. (Prize Medal awarded, Class XXVI.)

The following names have also been Honourably Mentioned : JOHN CARTER, No. 10, of Crayford in Kent ; J. K. HARVEY (Class XIX., No. 197), for the design of a carpet with a rich pattern ; and BENJ. HEALD, for his design for lace. (Prize Medal, Class XIX.)

THE GOVERNMENT HEAD SCHOOL OF DESIGN IN LONDON. The designs for textile fabrics contributed by the pupils, both male and female, of this establishment, were executed in such good taste, and with such correct knowledge of principles, that a Prize Medal was awarded to the Institution, and the names of several of the pupils were mentioned with approbation. These names will be found in the Report of Mr. Panizzi.

This seems to be the most fitting place to notice the patterns of the Oriental stuffs which India, Turkey, and Tunis contributed to the Exhibition in such rich variety.

In the fabrics of India the correct principle already laid down, namely, that patterns and colours should diversify plane surfaces without destroying or disturbing the impression of flatness, is as carefully observed as it was in the middle ages, when the decoration of walls, pavements, and carpets was brought to such perfection by the Arabs. But it is not only the observance of this principle which distinguishes the Indian stuffs in the Exhibition ; they are remarkable for the rich invention shown in the patterns, in which the beauty, distinctness, and variety of the forms, and the harmonious blending of severe colours, called forth the admiration of all true judges of art.

What a lesson such designs afford to manufacturers, even in those nations of Europe which have made the greatest progress in industry !

In these remarks I have specially referred to the productions of India. Some of the fabrics exhibited by Turkey and Tunis display analogous qualities, but in the greater part of these we trace in the patterns an European influence, which has overlaid or partly superseded the true characteristics of the national style of ornament.

6. *Architectural Designs.*

G. TRUEFITT, of London. A design for a Gothic tomb and canopy, to be executed in iron ; the proportions, in this design, are very good, the style very correct, and the treatment suitable to the material. Honourable Mention. (Cat., p. 149, No. 75.)

7. *Various processes of Printing, such as Lithography, Lithochromy, Zincography.*

The art of printing in colours has been brought to such perfection by the employment of several successive plates for the same impression, as in many cases to produce an effect quite equal to that of a painting.

(a.) Lithochromy.

DAY and SON, of London. The specimens exhibited by this establishment are admirable for keeping, force, and finish. Prize Medal. (Cat., p. 149, No. 80.)

M. and N. HANHART, of London. In the plates executed by these artists, there is a clearness, force, and harmony of colouring, combined in a degree which is very rarely attained. Prize Medal. (Cat., p. 149, No. 64.)

HULLMANDEL and WALTON, of London. In the works of these artists we find similar excellences in a very high degree. The specimens are executed partly with the stump, partly with lithographic chalk and the stump combined, and finally by printing in colours. Prize Medal. (Cat., p. 149, No. 71.)

OWEN JONES, of London. In the establishment of this artist flower and fruit pieces are executed with great force and truth, and in his patterns he shows excellent taste. In his imitations of miniatures he has been less happy, though these works display considerable merit. Prize Medal. (Cat., p. 149, No. 54.)

T. UNDERWOOD, of Birmingham. In the novel attempt to represent water-colour drawing by printing in colours, this artist has been most fortunate; the specimens exhibited by him are well worthy of Honourable Mention. (Cat., p. 149, No. 77.)

(b.) Printing in Oil-colours.

G. BAXTER, of London. The view of the exterior of the Exhibition Building, and a female portrait by this artist, show very great skill in a process which so seldom yields a successful result. Honourable Mention. (Cat., p. 150, No. 115.)

(c.) Zincography.

R. APPEL. This artist is the inventor of a process, by which he transfers to a zinc plate ancient or modern engravings, and woodcut impressions, as well as drawings executed either with the pen or the pencil. A peculiar kind of ink is employed for the transfer; and not only is a perfect facsimile of the original thus obtained, but copies, to any extent, of this facsimile are again produced, at an exceedingly moderate price, and all of equal excellence. A woodcut by Albert Durer, taken from his "Life of the Virgin," the zinc matrix to which this was transferred, and the impression from this plate, which were all exhibited, afford sufficient evidence of the value of the invention. Many years ago Messrs. DUPONT and Co., of Paris, obtained similar results by their process of transferring designs to stone; for this they have received a Prize Medal, in Class XVII. (Printing). The advantages of such mechanical means of multiplying rare and costly prints are too obvious to need remark. Every kind of drawing can be executed in Mr. Appel's prepared ink; his invention has therefore this great advantage, that it enables artists at once to fix and reproduce their sketches, instead of having recourse to lithography, woodcutting, or engraving on metal. The most rapid and evanescent expression of an artist's thought may thus be arrested, without impairing the spirit of the original sketch in the process of transfer. Prize Medal. (Cat., p. 153, No. 274.)

(d.) Facsimiles of Printing executed by the hand.

J. HARRIS, of London. The masterly imitation of old printing, by this artist, has received Honourable Mention. (Cat., p. 152, No. 244.)

C. ARCHITECTURAL DESIGNS.

1. *The Exhibition Building.*

In this most admirable edifice, every kind of excellence appears to be combined, whether we consider the wonderful adaptation of the whole building to its purpose, the surprising skill shown in the employment of glass and iron, which have never before been used as building materials on so vast a scale, the happy adjustment of the proportions, the calculation of which, from the complexity and extent of the whole plan, must have been exceedingly difficult, the simplicity of the mode of construction, or lastly, the judgment shown in the choice and disposition of the colours with which the Building is ornamented. The whole work reflects the greatest honour on all who had a share in it. The utmost praise is due to Mr. PAXTON for the design of the Building; to Messrs. FOX, HENDERSON, and Co., the Contractors, for the masterly manner in which it has been executed; and to Mr. OWEN JONES for the painting.* (Council Medals awarded to the two former by Class VII.)

2. *Models.*

The practical utility of architectural models, and the instruction and pleasure that may be derived from them, have never been more sensibly felt than at the present day. This branch of art was therefore very properly represented in the Exhibition.

JOHN GRANTHAM (Secretary to the Liverpool Local Committee). A Model of the town of Liverpool. This work is executed with great accuracy, the proportions are said to be very well preserved, and the details finished with great care. Prize Medal. (Cat., p. 10, No. 95.)

JABEZ JAMES, of London. A Model of the Britannia Tubular Bridge. Very valuable as showing the construction of this celebrated work. Prize Medal. (Cat., p. 10, No. 106. Prize Medal awarded also by Class VII.)

S. SALTER, of London. A Model of the Church of St. Nicholas, of Hamburg, executed after the designs of Mr. Scott. Also a Model of a Church at Wilton. These two models are entitled to the greatest praise, on account of the accuracy of the proportions, and the masterly manner in which all the details are expressed. Prize Medal for first. (Cat., p. 47, No. 221.)

N. J. COTTINGHAM, of London. A Model of a spandrel in an arch—Hereford Cathedral. The manner in which the character of Gothic architecture is pre-

* It has been remarked by several distinguished authorities that, when iron is painted, the nature of the material should be indicated by the colours employed. This is no doubt true as a general principle, yet in this instance a deviation from it seems allowable. The combination of white, blue, and red harmonizes most happily with the slender tent-like structure, and light, cheerful, appearance of the whole building, and contributes to produce that wondrous and fairy-like effect which has so impressed the minds of all who visited the Exhibition. A darker tone would have been inadmissible, as it would have given a gloomy appearance to the whole.

served in this model shows great knowledge on the part of its designer. Honourable Mention. (Cat., p. 9, No. 63.)

S. CUNDY, of London. A restoration of the tomb of Queen Philippa, Queen of Edward III., executed in alabaster, with very rich Gothic ornaments. Honourable Mention. (Cat., p. 9, No. 60. Prize Medal awarded by Class XXVII.)

T. DUNHILL, of London. Model of a Metropolitan Cattle-market, with abattoirs, and other appurtenances, executed in plaster and other materials, and very skilfully planned. Honourable Mention. (Cat., p. 44, No. 90.)

W. STUART, of Plymouth. Model of the Plymouth Breakwater in limestone. Honourable Mention. (Cat., p. 10, No. 28.)

In concluding this notice, I must also mention the Mediæval Court, fitted up by Professor A. W. PUGIN, one of the most distinguished among English architects as a designer of Gothic buildings and ornament. In this Court he has endeavoured, with great success, to present to the spectator a general idea of the ecclesiastical art of the middle ages, by exhibiting an assemblage of altars, shrines, tapestries, painted windows, chalices, and patens, vestments, and other ecclesiastical furniture and objects. Most of these articles are executed from his own drawings. The merit of the collection has been duly acknowledged by the Jury.

THE ZOLLVEREIN.

I. PRUSSIA.

Since the year 1815 great efforts have been made in Prussia, by the successive monarchs and administrations of Prussia, to encourage the Fine Arts in that country. Museums, and other buildings of a similar character, have been erected; sculptors, and more recently painters, have been employed in the execution of Monumental works; and the cultivation of all those manufactures on which Art can exercise any influence has been greatly promoted by the foundation of the "Institution for Trades," (*Gewerbe-Institut*), under the energetic and judicious management of Privy Councillor Beuth. That these efforts have led to the happiest results has been proved by the Exhibition, which has furnished to Prussia a long-desired opportunity of showing what progress has been made.

A. SCULPTURE AND WORKS OF PLASTIC ART.

1. *Sculpture on a large Scale.*

Until the commencement of the present century, the Berlin sculptors continued to imitate the false and mannered style of the contemporary French school. The first who returned to the principles of nature, and to a careful expression of details, was the sculptor Schadow.

But the Berlin school owes its present excellence to the auspicious co-operation of three great men, who devoted themselves to its improvement. These were, the late architect Schinkel, the late sculptor Frederick Tieck, and Christian Rauch, a sculptor whose active energies still remain unimpaired, notwithstanding his great age. These three artists had profoundly studied the masterpieces of ancient art; the contemplation of these had imbued their minds with an intense feeling for beauty, and revealed to them the great laws of style. Inspired by these models,

they did not attempt to reproduce them by a servile and spiritless imitation, but rather to apply the principles therein developed to works fitted for the wants of modern times, combining this reverence for antiquity with an earnest study of nature, and a most diligent and scientific carefulness of execution. It is to be regretted that Rauch himself contributed none of his works, if we except one or two copies from his *Victories*; and that many of his distinguished scholars, such as A. Fischer, Gustav Blaeser, Wredow, and Schievelbein were also absent.

But though the school of Berlin was thus only partially represented in the Exhibition, yet many of the works it contributed gave ample proof, how great have been the results of the combined influences which have aided in the development of German art.

A. KISS, of Berlin. An Amazon on Horseback attacked by a Tiger. With a ferocious bound the animal has leaped upon her horse, and fastened on him with teeth and claws. The Amazon is about to transfix her assailant with her spear. This work, which is on a colossal scale, has been cast in zinc by Geiss from the original model, and bronzed by electro-deposit. In this group, the artist has, by an original and powerful effort of invention, placed before our eyes the most critical moment of the action. The whole expression and character of the Amazon are very nobly conceived; the anatomy displays consummate knowledge; great style is shown in the general treatment of the surface, and the details are wrought out with wonderful force and truth. The whole work is full of soul; it seems the full, earnest utterance of a true artistic nature.

The great qualities of this work called forth, at the time of its completion, the most unbounded admiration on the part both of artists and friends of art. It was executed in bronze by a public subscription, and now ornaments one side of the staircase of the Royal Museum at Berlin.

The approbation which it has received proves that, where a work of art possesses striking merits, even considerable faults cannot counteract the favourable impression which is produced. It is one of the fundamental laws of sculpture "in the round" that from many, but, at all events, from the principal points of view the outlines of the figures shall be distinct, and at the same time beautiful; and this rule is signally transgressed in the work of Kiss. The forms of the tiger and the horse are blended together in one confused mass, so that the front view is very unsightly, and even in the side views we lose on one side the head of the horse, on the other that of the tiger. Council Medal. (Cat., p. 11, No. 279.)

F. DRAKE, of Berlin. The pedestal of a statue of King Frederick William III. of Prussia, erected by the inhabitants of Berlin as a token of their gratitude for the embellishments which this monarch has bestowed on their Thiergarten (Zoological Gardens). The work exhibited is in plaster, half the size of the original pedestal. In the reliefs with which it is ornamented the sculptor selected subjects which contain allusions to the local destination of his work. Thus he has represented a number of figures, of every age and sex, enjoying themselves in the open air. We see groups of children looking into a bird's nest or feeding the swans, young maidens weaving garlands, old people leading children to the scene of the sports, or contemplating their youthful gambols with an air of calm enjoyment. There is much beautiful feeling in the treatment of this subject: the heads are full of expression, the movements of the figures very spirited, and the



PART OF PEDESTAL TO MONUMENT OF FREDERIC WILLIAM III.

DRAKE.

different groups are skilfully connected. The composition is executed in a very good style of alto-relievo, the details finished with the greatest care.

On the whole, this work is deserving of the very great and general admiration that has been bestowed upon it. It may however be noted as a defect, that the artist has not throughout preserved the relative proportions of the figures. Prize Medal. (Cat., p. 11, No. 273.)

ALBERT WOLFF, of Berlin. A statue in marble of a young maiden holding a lamb in her arms. This figure is entitled by the sculptor "Innocence," and its purity and simplicity of character fully express such an idea. The drapery is throughout treated in a Plastic style, and the execution is very careful. Prize Medal. (Cat., p. 260, No. 307.)

T. KALIDE, of Berlin. A Group. A Boy, lightly grasping a swan and looking upward, holds up his left arm as if to guard himself. This group is designed for a fountain, the water being meant to issue from the beak of the swan.

The figure of the boy is very prettily conceived, and the action very spirited. The whole work is executed with care, and in a good style. Duplicates of this group were exhibited; one in bronze, the property of His Majesty the King of Prussia, the other cast in zinc by Geiss. Honourable Mention. (Cat., p. 259, No. 285. Prize Medal awarded, Class XXII.)

C. MÖLLER, of Berlin. Several bronze casts of animals from models by this artist were exhibited: a Newfoundland Dog, cast by Friebe, of Berlin; a smaller Dog of the same kind with a Boy, and a Bulldog with a Girl, by H. Fischer. These works are distinguished by great life and truth. They are very carefully executed, and in a good style. Honourable Mention. (Cat., p. 259, No. 292.)

LUDWIG WICHMANN, a pupil of Gottfried Schadow. A Young Maiden in the act of filling her pitcher with water. Cast in bronze, and tooled from the model of the original, in the foundry of Count Einsiedel, at Lauchhammer, in Saxony. This figure is distinguished by beauty of proportions, good anatomy, and careful execution. The Jury were, however, precluded from noticing it, because it was not exhibited in the artist's name, but in that of the foundry where it was cast.

2. *Sculpture on a small Scale.*

(a.) In Metal.

The Shield of Faith. This work was a present from His Majesty the King of Prussia to His Royal Highness the Prince of Wales. Though it belongs properly to Class XXIII., and has received a Council Medal from the Jury of that class, it is so exquisitely wrought, and the design is of so high an order of art, that I feel myself compelled to offer a few remarks on it here. In the execution of this work the talents of several most distinguished artists have been most felicitously combined. The architectural portion of the design is due to the Privy Councillor and Director of Architecture, Stüler. All the groups of figures are modelled from drawings by Cornelius, whose rich and fertile genius has here expressed in truly artistic language the cardinal idea of the Christian Faith, and happily combined with this principal motive an allusion to the immediate purpose for which the shield was executed.

The designs were modelled in low relief by the sculptor, A. Fischer, in a most

masterly manner, and with a true perception of the principles of Plastic Art. The reliefs were then moulded, and the casts from them finally chased and tooled with consummate skill by the engraver, A. Mertens.

The figures of the Twelve Apostles, which are from the designs of Cornelius, were beautifully cut in onyx by the distinguished gem-engraver, Calandrelli, who has long resided in Berlin; the fine enamels and ornamental work are executed by Klossauer, jeweller to the Prussian Court. The Council Medal awarded to this shield is presented to His Royal Highness the PRINCE OF WALES, as its exhibitor. (Cat., p. 6.)

J. WAGNER and SONS, jewellers to the Court of Berlin. An ornamental piece of plate to serve as a fruit-dish, in silver embossed work. This, like the preceding work, belongs in strictness to Class XXIII., in which it has received the Council Medal. I cannot, however, pass over in silence a work which shows to what perfection this class of art has been brought by the silversmiths of Berlin. In the whole design there is great beauty of form, and much invention is displayed in the subjects with which it is decorated. These represent the successive stages in the development of civilization.

The first scene represents the simple characteristics of that primeval age which is still engrossed in supplying the mere physical necessities of life, when hunting, fishing, and tending of flocks and herds, are the only occupations of man. This forms the pedestal of the vase: round the columns a more advanced civilization is represented by figures, with the symbols of tillage, horticulture, and the vintage. In the reliefs upon the body of the vase, which are still unfinished, we have the characteristics of a still higher stage of social refinement: mining, commerce, navigation, and the arts and sciences generally, are here represented figuratively.

As the apex of the whole composition, we have the Genius of Light overcoming a snake, designed to symbolize the highest form of civilization, when man has arrived at the government of those worst enemies, his own passions. Both the detached figures and the groups in relief which develop this train of ideas are disposed with admirable judgment about the vase; they are also executed with great knowledge, and a masterly finish of detail.

In the fruit, flowers, and foliage, which form the subordinate ornaments, the combination of a close imitation of nature with a very good style deserves the greatest praise. It may, however, be noticed as a defect, that the mass of the figure of the Genius is somewhat too large, and that his wings appear ill set on, as if not originally united to his body. It is to be regretted that another Berlin artist, equally distinguished for his embossed work, M. Netto, contributed nothing to the Exhibition.

JULIUS FRANZ. Two Victories modelled by this artist, from the figures by Rauch, on a reduced scale, of about two feet in height, cast in bronze, and tooled by Fischer. These works are remarkable for the scrupulous accuracy of their execution.

J. BERNHARD AFINGER. Four medallion portraits cast in bronze by this artist deserve praise for the truth of the general conception; but the execution, though always careful, is occasionally somewhat feeble, and the treatment too picturesque. Honourable Mention. (Cat., p. 260, No. 309.)

(b.) Medals.

K. FISCHER, Medalist, of Berlin, exhibits nine medals. In the designs of these, both obverse and reverse, good taste and feeling for nature are combined with correctness of style in the treatment of low relief, and a very careful and conscientious method of execution.

The medal struck in honour of Alexander von Humboldt, as the author of *Cosmos*, is specially worthy of mention. Prize Medal. (Cat., p. 259, No. 281.)

C. PFEUFFER, Chief Medalist to the Court of Berlin, exhibits 22 medals. These show a very careful execution, but the overcharged character of the forms, which are sometimes too full and heavy, is at variance with the true laws of this branch of art. Honourable Mention. (Cat., p. 259, No. 286.)

The works exhibited by the ROYAL IRON FOUNDRY OF BERLIN fall under Class XXII., and have there been rewarded with a Council Medal; they belong, however, so completely to the province of Art that they deserve some notice here. The admirable taste shown in the ornaments of these works, and the good style of the sculptures, prove the extensive and abiding influence of the immortal Schinkel in this establishment. Among the works which specially deserve notice are, a large vase inlaid with silver and ornamented with a design by Hesse, chief architect of the Palace, after Thorwaldsen's *Triumph of Alexander*, and two stands ornamented in a similar style with small groups.

B. GRAPHIC REPRESENTATIONS ON PLANE SURFACES.

Designs for Tapestry.

This kind of work has been more extensively practised and brought to a greater perfection in Berlin than in any other place. Among the different designs of this class, those of M. Grünthal deserve special notice for their general good taste. Honourable Mention. (Cat., p. 256, No. 166.)

Lithochromy.

WINCKELMANN and SONS, Berlin. The specimens of Lithochromy exhibited by these artists are among the most perfect that have been produced. By the employment of a number of stones for the same impression, a great variety of tints has been obtained, so that the most complicated objects, and particularly architectural ornaments, can be represented with all that refinement of gradation which they present in a perspective view. The most remarkable specimens are the views of the Castle of Orianda, designed by Schinkel for the Emperor of Russia, and several of the Plates in a magnificent work on Architectural Decoration, by M. Lewis Gruner, of London. Considering the excellence of these lithochromes, their price is proportionately moderate, which is an additional merit. Prize Medal. (Cat., p. 260, No. 306.)

C. ARCHITECTURE.

Models.

J. C. BOESCHE, of Magdeburg. A model of the Cathedral at Magdeburg, of considerable dimensions; also a model of the beautiful fountain at Nuremberg.

These works are accurate in their general proportions, and the details are faithfully and carefully worked out. A model for another fountain is very neatly executed, and the design is pretty and original. Prize Medal. (Cat., p. 271, No. 785.)

To this artist the Jury have also made a money award of 30*l.* sterling.

II. BAVARIA.

A. SCULPTURE AND WORKS OF PLASTIC ART.

1. *Sculpture on a large Scale.*

The Munich school of sculpture owes its importance to SCHWANTHALER, whose untimely death in the flower of his years we have to deplore. The number of highly imaginative designs which the fertile invention of this artist has drawn from ancient mythology, from the middle ages, and modern times, has justly earned for him a lasting fame. At the Exhibition he was represented only by a small number of his works. Though in the statues of Queen Libusa and of King George Podiebrad of Bohemia, cast by Miller of Munich from Schwanthaler's models, the imaginative conception and noble proportions of the figures are well worthy of this great artist, they afford but a very imperfect idea of the whole range and compass of his genius. As they were not exhibited in the name of the artist, they could not enter into competition for a prize.

It is to be regretted that the distinguished sculptor WIELMAN contributed nothing to the Exhibition.

JOHN HALBIG, of Munich. A Colossal Lion, cast in one piece by Miller; part of a group representing Victory in a Chariot drawn by Four Lions, and designed to be placed on the triumphal arch at Munich. The motive of this work is good, but the form is too heavy and clumsy. This overcharged appearance may perhaps be partly explained by supposing it to be calculated for the height at which the figure is to be placed.

J. LEEB, of Munich. A Young Girl looking at a Nest full of young Cupids, which she holds in her hands. This figure shows *naïveté* in its conception, and is carefully executed in marble. Honourable Mention. (Cat., p. 274, No. 89.)

2. *Sculpture on a small Scale.*

M. HAGEN, of Munich. A large Ivory Cup, on which are sculptured figures of children playing, in the style of Fiamingo; in a very good style, and executed with great care. Honourable Mention. (Cat., p. 274, No. 83.)

B. GRAPHIC REPRESENTATIONS ON PLANE SURFACES.

1. *New Processes of Painting.*

J. N. VON FUCHS, Professor in Munich, has invented a new mode of wall-painting, called *stereochromy*, which has many advantages over the fresco method which has been so generally adopted for walls. By the new process, the surface can be retouched to any extent, as in the case of an oil-painting, while it possesses far greater durability, being protected by a varnish from the effect of exposure to the weather. A figure painted by M. Muhr, a pupil of Kaulbach, exhibited as a



GEORGE I. OF BOHEMIA.

MILLER.



LIBUSSA.

MILLER.

sample of this process, affords good proof of its merit. Prize Medal. (Cat., p. 274, No. 91.)

2. *Enamels on Porcelain and on Metal.*

OTTO WUSTLICH, of the Fine Arts Establishment of Schmidt, of Bamberg. A miniature of Charles IX. firing upon the Huguenots, on the night of the Massacre of St. Bartholomew, after a picture by Baron Wappers, of Brussels. This miniature is remarkable for its truth, its force and transparency of colouring, the goodness of its general tone, and its careful execution. Prize Medal. (Cat., p. 274, No. 92.)

3. *Painting on Glass.*

STEPHEN KELLNER, of Nuremberg. A reduced copy of the celebrated painting by Volkamer, in the Church of St. Laurence at Nuremberg. In this work, which is executed with the greatest care, the colours and every detail of the original picture are faithfully rendered. Prize Medal. (Cat., p. 274, No. 86.)

4. *Various Processes of Printing.*

FRANZ VON KOBELL, Professor at Munich, exhibits a new mode of multiplying Indian Ink and other drawings, by means of copper-plates deposited by galvanic action: the invention is hence called galvanography. The process is as follows:—The drawing having been first executed either with encaustic colours or with lithographic chalk, a plate of copper is precipitated upon it by galvanic action. By the contact of the particles of metal with the colours or chalk drawing, the plate receives, during its formation, an actual impression of the delineated surfaces, the lines being indented on the copper as if by the ordinary process of the burin. The plate, thus engraved by galvanic agency, becomes a matrix capable of yielding other impressions.

F. HANFSTÄNGEL, of the Lithographic Establishment of Munich, has exhibited two plates as samples of this process; the matrix or plate impressed by galvanography, and the matrix, or impression, taken again from this plate. An impression in paper, showing the result, is added. These specimens are remarkable for the force, clearness, and evenness of the print. Honourable Mention. (Cat., p. 274, No. 85.)

III. KINGDOM OF SAXONY.

A. SCULPTURE AND WORKS OF PLASTIC ART.

Sculpture on a large Scale.

ERNST RIETSCHEL, of Dresden. This distinguished artist, one of the ablest pupils of Rauch, exhibits three works, the varied character of which shows the versatility of his talents. 1. A group of the Virgin weeping over the body of our Saviour, cast in plaster, from a model executed for His Majesty the King of Prussia. In the figure of our Saviour, anatomical truth is combined with nobleness of form; the countenance has a fine dignified character; its mild transfigured expression proclaims the triumph over the agonies of death. In the Mary, the countenance and the clasped hands reveal the deepest but most resigned sorrow of soul. The drapery of this figure is admirably composed. The execution is

fully worthy of the invention shown in this group. 2. The Angel of Christ, a very noble relief in marble. The angel is represented in the form of a graceful youth, floating in the air, with the infant Saviour in his arms; two infant angels attend his course. This group has a peculiar charm from the beauty of the heads and figures, the grace of the action, the suddenness of the movement impressed on the flying drapery, and the masterly yet tender handling of the marble. 3. Love riding on a Panther, whose course he tries to arrest, eagerly grasping his neck with both his hands. This beautiful conception is quite in the spirit of ancient art, and is expressed with great vigour of hand. Prize Medal. (Cat., p. 279, No. 185.)

B. GRAPHIC REPRESENTATIONS ON PLANE SURFACES.

Enamels on Porcelain.

HEINRICH BUCHER, of Dresden. This artist exhibits a rich collection of miniatures on enamel, of which I will only notice here the copy of the celebrated "Christ with the Tribute-money" of Titian, in the Dresden Gallery, in which the character and deep transparent colouring of the original are admirably rendered. The works of this artist are also remarkable for their very moderate price. Prize Medal. (Cat., p. 279, No. 176.)

GUSTAV WALTHER. The six enamels, after well-known pictures in the Dresden Gallery, exhibited by this artist, are creditable works in this class of art. Honourable Mention. (Cat., p. 279, No. 177.)

IV. DUCHY OF SAXE-GOTHA.

F. E. HENNEBERG and Co. A view of the Wetterhorn, in Switzerland, painted on china. This work has considerable merit. Honourable Mention. (Cat., p. 272, No. 772.)

V. WURTEMBERG.

A. SCULPTURE AND WORKS OF PLASTIC ART.

Sculpture on a large Scale.

L. VON HOFER, sculptor, of Stuttgart. Casts in plaster from two Arabian thorough-bred horses, in the stud of the King of Wurtemberg. They are represented rearing; each is held down by a naked attendant. The original groups are executed in marble, and are placed in the garden of the palace at Wurtemberg. Good judges of horses are of opinion that in these works of Hofer the characteristics of a particular breed of horses are very accurately given. (Cat., p. 281, No. 105.)

T. WAGNER, of Stuttgart. The Penitent Magdalen, a figure in marble. This work is characterised by truth of expression and careful execution, but the drapery is drawn over the ridge of the leg so as to intercept its outline, in a manner not consistent with the laws of Plastic Art. Honourable Mention. (Cat., p. 281, No. 108.)

VI. ELECTORATE OF HESSE CASSEL.

C. M. WEISHAUP T SONS, jewellers, of Hanau. A chess-board in gold and silver. The sides of the board are richly ornamented with festoons of flowers, small animals, birds, &c., in admirable taste, and executed in enamel with the utmost

delicacy and minuteness. The pieces are finished with the same extraordinary richness and refinement of ornament. The kings are portraits of the two great antagonist monarchs of the early part of the sixteenth century, the Emperor Charles V. and Francis I. of France; the queens represent Margaret of Parma, the daughter of the Emperor, and Margaret of Valois, the sister of Francis. The work properly belongs to Class XXIII., and has been rewarded there with a Council Medal; but from its great merit as a work of art, I have felt it my duty to notice it here. (Cat., p. 262, No. 412.)

VII. GRAND DUCHY OF HESSE DARMSTADT.

C. W. HEYL, ivory-carver in Darmstadt. A large goblet, on which is carved in relief the battle of Arminius, after a design by Lindenschmidt. This work is entitled to great credit, from the extraordinary finish of the execution. The introduction, however, of several planes in the relief, and the violent foreshortenings, give to the whole composition a picturesque character at variance with the principles of Plastic Art, whilst in some of the foreshortenings, particularly that of a horse, there is a positive want of drawing. Honourable Mention. (Cat., p. 274, No. 75.)

VIII. OLDENBURG.

Architectural Models.

J. H. CASSEBOHM, of Oldenburg. A model of the Castle of Oldenburg, correct in its general proportions, and carefully finished, though in the details of the architecture the character of the several members is not accurately rendered. Honourable Mention. (Cat., p. 291, No. 1.)

FRANCE.

The French have been distinguished for many generations by the great encouragement they have bestowed, as a nation, on the Fine Arts. The French Government, under every change in its outward form, has not failed to regard Art as one of the most important instruments of civilization; and recognising its great and beneficial influence on the manufactures of the country, has, by the most liberal grants, placed it in a peculiar manner under the protection of the State. Millions of the national revenue have, in consequence, been devoted to the erection of great public edifices, and to the purchase of the best works of native artists. Establishments like that of the Gobelins Tapestry, and the Sèvres China Manufactory, or the Ecole des Arts et des Métiers, have been not only founded but maintained by the State at an immense cost. In consequence of this encouragement on the part of the Government, the French school of Art has been most fertile in its productions; many branches of art have been brought to a rare degree of perfection, and the diffusion of an improved taste has exercised a most beneficial influence on a variety of trades and handicrafts. By these means Paris has become an universal market, not only for the Fine Arts themselves, but for most of the branches of industry to which they are in any way allied.

A. SCULPTURE AND WORKS OF PLASTIC ART.

1. *Sculpture on a large Scale.*

During the first years of the French Revolution, commencing with 1789 onwards, a reaction against the style of art previously esteemed was brought about by the painter David. This movement was followed up by the sculptors Chaudet and Bosio, who devoted themselves to a diligent but cold imitation of the masterpieces of ancient Roman sculpture.

At a later period the style of many sculptors was affected by the passing but dangerous influence of Canova. After this a very strong Realistic tendency prevailed, and at a later period still the influence of the best Greek Art has been felt in the French as in other modern schools. This tendency on the one hand to revert to the pure Greek models, and the Realistic tendency on the other hand, are the two chief movements which characterize the modern French school. Both styles, and the Realistic especially, were represented in the Exhibition by a number of remarkable works; but it is to be regretted that many distinguished sculptors, such as Rude, Duret, Jaley, Simard, Dumon, Ramay, the Comte Nieuwerkerke, the Baron de Triqueti, and David of Angers, did not contribute any work.

J. PRADIER, Member of the Institute; Phryne. In this youthful female figure the beauty of feature, the subtle refinement of form, and the sprightly grace of the attitude, alike correspond with the name of the celebrated *Hetaira* which M. Pradier has given to his work. The careful chiselling of the surface, and the general breadth of the treatment, show that the sculptor has not studied the masterpieces of Greek Art in vain. On the other hand, for so young and beautiful a form, there is rather too large a development of the body; the drapery in front falls too perpendicularly, so as to cut the figure in two, and its monotonous parallel lines want movement; whilst behind, the mass of folds assumes the unsightly form of a triangle. The idea of ornamenting the hem of the garment with a red "Mæander" border is not happy, for, in contrast with the colourless uniformity of the rest of the marble, such an ornament appears crude and misplaced.

This artist also exhibits a group, cast in bronze, of a crouching Venus conversing with a Cupid, who leans against her. There is great originality in the conception of this group, and the artist has been for the most part very happy in the selection and treatment of the forms. The execution, however, is not equally careful throughout. Council Medal for the Phryne. (Cat., p. 245, No. 1407.)

AUGUSTE DEBAY, of Paris. "Le Premier Berceau." This name is given by the sculptor to a figure of Eve, seated, with her hands clasped over one knee, and supporting in her lap her sleeping infants, Cain and Abel. In the form and attitude of Eve there is great beauty, truth, and refinement of feeling, and the countenance admirably expresses the tenderness of a mother. The treatment of the figure, however, is rather too picturesque in character; the general motive is somewhat strained and violent; the forms of the children are not happily composed; and there is great want of style in the hair of Eve, which is gathered together behind in a somewhat clumsy mass. Prize Medal. (Cat., p. 221, No. 45.)

E. L. LEQUESNE, of Paris. A Satyr, cast in bronze, represented after the manner of the ancients, dancing on a wine-skin, in a state of joyous drunkenness. In this figure the character of the head, and of the strong, hard muscles, quite corresponds



PHRYNE.
(MARBLE)

PRADIER.



LE PREMIER BERCEAU.
(MARBLE)

DEBAY.



DANCING FAUN.
(BRONZE)

LEQUESNE.



CHOLERA.
(PLASTER)

ETEX.



CAIN AND HIS FAMILY.
(PLASTER)

ETEX.



CEPHALUS AND PROCRIS.

RAMUS.



BUSTS IN BRONZE.

CONDIER.



DEATH OF THE STAG.
(BRONZE)

DEBAY.

with the general Satyr type created by the imagination of the ancient artist. The motion is easy and natural, and the carefulness of the execution is maintained throughout. Prize Medal. (Cat., p. 11.)

A. ETEX. Of the three groups exhibited by this artist the most agreeable is that in marble of Hero and Leander, standing mournfully beside each other.

Cain and his Family. The characteristics of a base, abandoned nature are admirably expressed in the countenance and coarse clumsy limbs of Cain, which are very carefully studied from the life; in plaster.

The allegorical group (in plaster) of the City of Paris imploring heaven to take away the plague of Cholera, is a less agreeable work, on account of the manner in which the subject is treated. The City is represented as a seated female figure, with an old man and a youth expiring of the pestilence, one on each side. In these figures the moment of death is expressed with wonderful truth. This work is a specimen of that class of art which, seeking to act on the feelings through the representation of mere physical suffering, may be called the Revolting, a style which appears to be little cultivated or admired except in France.

These works all show great knowledge on the part of the sculptor. Prize Medal. (Cat., p. 242, No. 1215, p. 11.)

J. CLESINGER, of Besançon. A Bacchante, who is rolling on the ground in a state of drunken excitement. This figure is remarkable for the masterly chiselling of the marble, the great knowledge of anatomy, and the beauty of the countenance; but these excellences do not sufficiently excuse the sculptor for having in this work allowed his imagination to be perverted and degraded to the service of a low sensuality. Moreover, the treatment of the hair is at variance with the principles of a good style, and there is a great want of taste in the arrangement of the folds of the drapery. The Jury considered this subject to be of an objectionable character, but have made Honourable Mention of the excellences pointed out above. (Cat., p. 228, No. 419.)

J. M. RAMUS. Cephalus, tenderly supporting in his arms the dying Procris. This group is, in its leading lines, very happily composed, and shows in the forms much knowledge of nature; but the modelling is not in a sufficiently large style, and is not sustained throughout. Prize Medal. (Cat., p. 245, No. 1419.)

M. PASCAL, of Paris. A group, in marble, of a monk holding out a crucifix, which a little boy is eagerly kissing; a little girl stands by, steadfastly gazing at him. There is a charming feeling for nature in the expression of the heads; but the general composition, and particularly the drapery, may be termed rather Picturesque than Plastic in style, and, with the exception of the nude forms, the whole is only sketched out in the marble. Honourable Mention. (Cat., p. 250, No. 1660.)

C. CORDIER, of Paris. The head of a negro, cast in bronze, by this artist, is a true example of characteristic portraiture; the conception is full of life, the execution most masterly, and well sustained throughout. Honourable Mention. (Cat., p. 229, No. 460.)

JEAN DEBAY, of Paris. A group of a young hunter, rushing forward to despatch a stag pulled down by a hound. The hunter is naked, and the whole type is conceived in the spirit of ancient art. This group, from the natural manner of the action, forms a very pleasing composition. The hunter and the animals are

modelled with great knowledge, and a good style is shown in the execution. Prize Medal. (Main Avenue East.)

FRATIN, of Paris. This artist, the most celebrated sculptor of animals in France at the present day, contributes to the Exhibition two eagles with a wild goat, which they have slain, a greyhound, another hound, life size, and several animals on a smaller scale, all in bronze. These works are fully worthy of the artist's reputation. The general conception is most spirited, the details of nature are most faithfully rendered, and the treatment throughout, particularly of the plumage and the skins, is most careful, and in a very good style. Prize Medal. (Cat., p. 242, No. 1235.)

A. LECHESNE, of Paris. Two groups, in plaster, of dogs and children. In one is represented a dog rescuing a child from the attack of a snake; in the other, which forms the sequel to the preceding, the snake lying dead, the dog exhausted, and the child full of joy and gratitude for its rescue. These works are very remarkable, from the extraordinary truth and spirit in the modelling and expression of the dog's head. The form of the child, on the contrary, is too swollen and coarse; and in the representation of the shaggy coat of the dog, the execution is too minute, and not in a legitimate style.

In another group, a woman is lying on the ground asleep, or dead. Above her hovers an eagle, about to carry off her child. Here, again, the treatment of the bird is very masterly, and by far the best part of the work. Prize Medal. (Cat., p. 11, No. 573, second improved edition.)

BONNASSIEUX, of Paris. A group, in bronze, representing Cupid, as a youthful figure, clipping the tips of his own wings; standing beside him is a dog. The form of the Cupid is very graceful, but the head is too directly copied from the antique type. The execution is very unequal; the dog, in particular, is very carelessly modelled. Honourable Mention. (Cat., p. 222, No. 64.)

A. G. FOURDINOIS. A large sideboard, ornamented with figures and dogs, on a large scale, carved in wood. In these the artist has shown such a happy invention, and such power of execution, that this work must be considered to rank as sculpture, and cannot be passed without a notice here, although it belongs to Class XXVI., and has been rewarded in that Class with a Council Medal.

It may not here be out of place, after this notice of the works of English, French, and German artists, to compare briefly the intellectual tendencies which these three great nations severally manifest in their schools of sculpture.

In each of these schools, though in the case of England only within the present generation, Greek sculpture has been acknowledged as the standard by which all creations of ideal art must be judged.

The English school has, on the one hand, sought to attain the qualities of grace and loveliness of form; more recently this school has also aimed at strength and manliness of character, chiefly in strong action. The French have principally turned their attention to the representation of sensual beauty, to the tender feelings called forth by the relations between the sexes, to other forms of the Sentimental, or to the style which may be designated as the Revolting.

Finally, German art has been especially devoted to the representation of deep religious feeling, or of calm, idyllic scenes; it has also endeavoured to treat the most stirring moments of real life in a grand and impressive manner.



GROUP OF EAGLES.
(BRONZE)

FRATIN.



DOG PROTECTING A CHILD.
(PLASTER)

LECHESNE.



CHILD CARESSING HIS DEFENDER.
(PLASTER)

LECHESNE.

Of the works contributed to the Exhibition by these three nations, those most distinguished in the foregoing notices may be fairly cited in proof of the success with which each school has followed out its peculiar bent.

Sculpture on a small Scale.

(a.) In Metal.

Among the French works in silver analogous in style with the productions of Vechte mentioned before, is a service of plate in the taste of the sixteenth century, executed by FEUCHER, and exhibited by FROMENT MEURICE. This work is the property of the Duc de Luynes. A Prize Medal has been awarded to it in Class XXIII.

The French department of the Exhibition displayed an extraordinary abundance of small groups of human figures and animals, and other small bronzes.

Many of these are from the designs of distinguished artists, among whom may be noticed PASCAL, who contributes a charming group of three children with bunches of grapes, designed for a dinner service, Fratin, and also Méné, who works in the same style as Fratin.

In other bronzes we find copies from the works of celebrated sculptors, such as Rude, Duvet, and Pradier; these are often very well executed. A Daphnis and Chloe, after Gaylard, deserves special notice. But a great number of these specimens do not rise above the level of very pretty ornaments, executed without much style, and a notice of them here would occupy too much space. As the French medallists sent no specimen of their works to the Exhibition, no mention has been made of them in this Report, though the skill of many of these artists is very generally acknowledged.

(b.) Sculpture in Ivory.

L. LAUTZ, of Paris. A great cup, ornamented with reliefs, representing a battle scene. The composition of these is too picturesque, and not treated in accordance with the principles of Plastic Art; but it must be admitted that this is a work of extraordinary merit in the drawing and execution. Honourable Mention. (Cat., p. 226, No. 295.)

(c.) Sculpture in Wood.

M. J. LIÉNARD, of Paris. A Boar-hunt, carved on a clock-case. Although this work is treated in a manner utterly at variance with the principles of Plastic Art, it is nevertheless a perfect masterpiece for truth of imitation, drawing, and execution. This artist has received from the Jury of Class XXVI. the Council Medal, especially for a richly ornamented clockcase, but his merits have been also acknowledged in Class XXX. by the award of a Prize Medal. (Cat., p. 244, No. 1326.)

The process invented by Mr. A. COLLAS, for reducing sculpture by machinery, which has been already referred to in the opening of this Report, must be noticed here. Prize Medal. (Cat., p. 251, No. 1709.)

B. GRAPHIC REPRESENTATIONS ON PLANE SURFACES.

1. *New Processes of Painting.*

It is now some years since a process of painting on lava has been perfected at Paris, chiefly by the exertions of the celebrated architect Hittorf. This kind of painting is as durable as that on porcelain, and is burnt in in the same manner. A copy of Raphael's picture in the Louvre, called *La Belle Jardinière*, executed by J. DEVERS, was contributed to the Exhibition as a specimen of this process. It is very carefully and faithfully copied, but the flesh is rather heavy and deficient in transparency. Prize Medal. (Cat., p. 235, No. 818.)

2. *Enamels on Porcelain and on Metal.*

Nowhere in Europe has the art of painting in enamel been carried to such perfection as in the celebrated manufactory of Sèvres. The works of this establishment are distinguished not only by the extent of the enamelled surfaces, but also by the perfection with which facsimiles of celebrated pictures are executed, the drawing and colouring of the original being preserved with marvellous truth. The Jury has therefore awarded a Prize Medal to M. DIETERLE (1369), as the Director of an establishment where such great results have been attained. Although it is to be regretted that the celebrated Constantine contributed no specimens of his works, the Exhibition contained a great number of paintings of the greatest merit.

Madame A. DUCLUZEAU, of Paris. This most distinguished artist, whose recent decease I regret here to announce, contributed masterly copies of the following pictures in the Louvre:—*a.* *La Vierge au Linge*, by Raphael; *b.* The portrait of Vandyke, by his own hand; *c.* A portrait of a male personage, recently ascertained to be a masterpiece of Johann von Calcar; *d.* The portrait of Her Majesty Queen Victoria, after Winterhalter, (Cat., p. 245, No. 1369, and p. 10, No. 96.)

JACOBBER, of Paris. A Flower-piece, after Jan Van Huysum, by this artist, is a perfect masterpiece. Another flower-piece, after Von Spandonck, has also great merit. Prize Medal. (Cat., p. 225, No. 271.)

A. BÉRANGER, of Paris. The copy of a Portrait by Rubens, in the Louvre, and one of His Royal Highness Prince Albert, after a portrait by Winterhalter. Prize Medal. (Cat., p. 245, No. 1369, and p. 10, No. 97.)

Madame P. LAURENT, of Paris. Three remarkable enamels on copper—two of which were after Raphael, the other, a Venus—were exhibited by this skilful artist. Prize Medal. (Cat., p. 245, No. 1369.)

Madame JACOTOT, of Paris. This celebrated artist, now far advanced in years, contributed a copy of the portrait of Raphael, after the picture in the Portrait Gallery at Florence. The original is rendered with great truth. Prize Medal. (Cat., p. 245, No. 1369.)

BONNET, of Paris. *St. John*, enamelled on iron, of great merit. Prize Medal. (Cat., p. 245, No. 1369.)

SCHILT, of Paris. Paintings on two porcelain vases, and on a table, very masterly in execution. Prize Medal. (Cat., p. 245, No. 1369.)

Mme. TURGAN. A Holy Family, after Raphael, of remarkable merit. Honourable Mention. (Cat., p. 247, No. 1504 A.)

MARIETTE DE CHASSAGNE. A copy of the celebrated picture, by Horace Vernet, the meeting of Michael Angelo and Raphael, exhibited by Boyer, of Paris. (Cat., p. 248, No. 1554.) In this work every detail of the original is faithfully rendered. Honourable Mention.

HAMON. A casket of metal, with figures, *en grisaille*. In this work there is a successful revival of the process for which the Limoges school of enamel was so distinguished in the sixteenth century. Prize Medal. (Cat., p. 245, No. 1369.)

3. *Painting on Glass.*

(a.) Ecclesiastical Style.

ALFRED GERENTÉ, of Paris. A window in the style of the twelfth century. In the figures, which represent the history of Samson, and particularly in the ornaments, the style of the period is rendered with extraordinary mastery and truth. Prize Medal. (Cat., p. 224, No. 231.)

A. LUSSON, of Paris. In some windows in the taste of the thirteenth, fifteenth, and sixteenth centuries, the artist has given the style of each period with great knowledge and care. Honourable Mention. (Cat., p. 230, No. 565.)

(b.) Pictorial Style.

MARECHAL and GUYNON, of Metz. The sick of the plague receiving the Eucharist. The characteristics of a picture—keeping, truth of drawing, and expression—are very successfully rendered, and the advantages of a material admitting of such force and transparency of colours as glass are turned to the best account. These excellences are also exhibited in a high degree in a male portrait. Prize Medal. (Cat., No. 329.)

4. *Inlaid Works in Metal.*

J. ROUCOU. Different kinds of arms, such as pistols, inlaid with gold and silver ornaments, in very refined taste, and executed with rare mastery of hand. Prize Medal. (Cat., No. 1689.)

5. *Designs.*

(a.) For Woven and Printed Fabrics.

E. LAROCHE. A volume containing many designs for shawls, barèges, and muslins. The patterns show great taste and adaptation to the materials, and are admirably executed. Prize Medal. (Cat., No. 291.)

BERRUS BROTHERS. This establishment is one of the largest manufactories in France, and the designs for shawls which it exhibits have most remarkable merit both in regard to the patterns and the colours. The introduction of small landscapes, however, in some of these designs, is an infringement on the principle which has been already stated in this Report, that the pattern must not disturb the idea of flatness in the surface. Prize Medal. (Cat., No. 55.)

A. COUDER. Designs for shawls and other stuffs. The execution of all these is very masterly, and those for shawls are in a very good taste. The others are very deficient in this quality. Prize Medal. (Cat., No. 1566.)

J. CHEBEAUX. Some of the designs for cotton and calico by this artist show a very happy invention, and are executed with very great skill. In his designs for

other materials the execution is equally skilful, though there is a want of taste. Prize Medal. (Cat., No. 1146.)

The following artists deserve notice both for the taste and execution of their designs :—

F. DIDIER (820) and MEYNIER (638), both of Paris, in their designs for shawls ; NAZE and Co. (625), and BRAUN (72), in their designs for cottons ; E. PICARD (347), in his designs for calicoes ; J. H. MÉRAUX (631), in his designs for lace. All these have obtained Honourable Mention, and the last a Prize Medal. (Class XIX.)

(b.) For Painted Windows.

N. A. GALIMARD, of Paris. In these designs the artist has been very successful in representing figures according to nature, and under the conditions of the Architectonic style. Honourable Mention. (Cat., No. 228.)

6. *The Government Manufactory of Gobelines and Beauvais Tapestry.*

This celebrated establishment, which has produced such a number of copies of celebrated pictures, contributed two specimens of tapestry to the Exhibition. One of these is a copy of Raphael's fresco in the Farnesina, in which Psyche is represented carried through the air by genii, and carrying the vessel which, at the behest of Venus, she has brought from the nether world. The other piece of tapestry is a copy of the celebrated picture by Horace Vernet, representing Ali Pasha looking on at the massacre of the Mamelukes, who, at his command, were shot by his soldiers. In both these copies not only is the general effect of the original picture faithfully rendered, but the intention and feeling of the artist are preserved in a degree which could hardly be expected, when we remember that the process by which these copies are executed is a purely mechanical one. (Council Medal, jointly with Class XIX.)

7. *Different kinds of Printing, such as Lithography and Lithochromy.*

R. J. LEMERCIER, of Paris. This artist exhibits a number of lithographs, which, from their force, depth of shadow, and fine gradation of tints and general tone, must rank among the most remarkable specimens of this art which have yet been produced. Prize Medal. (Cat., p. 230, No. 558.)

Lithochromy.

ENGELMANN. This celebrated establishment has well sustained its reputation by the series of admirably-executed specimens of lithochromy which it exhibits.

Printing in Colours from Wood Blocks.

G. SILBERMANN, of Strasburg, is the inventor of this mode of printing, and the coloured impressions from wood blocks exhibited by this artist are in every way remarkable. Prize Medal. (Cat., p. 227, No. 374.)

Although the facsimiles of the illuminations and initial letters of ancient MSS., exhibited by the Count AUGUSTE DE BASTARD, are worthy of the greatest admiration, on account of the extraordinary truth and skill with which they are executed, yet these works ought hardly to have been admitted into the Exhibition, as most of them were finished by hand. (Cat., p. 251, No. 1717.)



ISHMAEL.
(MARBLE)

STRAZZA.



EVE.
(MARBLE)

MONTI.



SUSANNA.
(MARBLE)

GALLI.



DAVID.
(MARBLE)

FRACCAROLI.



ACHILLES WOUNDED.
(MARBLE)

FRACCAROLI.

Here ought not to be omitted the name of Mr. C. E. CLERGET, of Paris, for his designs generally, and his exhibited works in ornament. Prize Medal. (Cat., p. 235, No. 799.)

AUSTRIA.

A. SCULPTURE AND WORKS OF PLASTIC ART.

1. *Sculpture on a large Scale.*

The only parts of the Austrian dominions from which large works of sculpture have been contributed are the Italian provinces, and especially Milan. In these works may be remarked a strong tendency to Realism.

G. STRAZZA, of Milan. Ishmael. This name is given by the artist to the figure of a boy lying on the earth, expiring of thirst. The dry and meagre forms, characteristic of this period of boyhood, are rendered with a truth which borders on the repulsive. The execution is masterly. The head, which is evidently studied from some type quite foreign to the subject of this work, conveys an expression of exhaustion which is almost painful. In the representation of this subject by painters, an angel bringing help to Ishmael is always introduced, and from the absence of this figure the general impression produced by the work of M. Strazza is most painful, and unrelieved by any mitigating circumstance. Prize Medal. (Cat., p. 205, No. 713.)

R. MONTI, of Milan. Eve after the Fall, arrived at the full consciousness of her crime. This figure, which is in marble, is appropriately conceived; the motive is pleasing, and the execution is very careful. It has consequently obtained from the Jury a Prize Medal. (Cat., p. 206, No. 746.)

This figure was not so generally admired by the public as another work by the same artist, representing a girl kneeling, with a thin veil thrown over her face; but the preference was not rightly given. Though extraordinary skill is shown in the execution of this veiled figure, true judges of art must always esteem it a mere specimen of dexterous workmanship; and they cannot but think, that in thus deviating from the undisguised representation of the human features, the artist has renounced the only means by which beauty, character, and expression, can be distinctly rendered in the countenance.

A. GALLI, of Milan. A youthful female figure, to which the sculptor has given the name of Susanna. The forms are pleasing and the movement pretty, and the work is very carefully executed in marble. But without the addition of the two Elders it would be impossible to recognise the subject. Prize Medal. (Cat., p. 205, No. 711.)

A. SANGIORGIO, of Milan. A colossal bust, in marble, of the poet Vincenzo Monti. The conception of this work is very spirited, and the execution most masterly and careful. Honourable Mention. (Cat., p. 205, No. 722.)

I. FRACCAROLI, of Verona. David in the act of slinging the stone at Goliath. The motive of this figure is very spirited, but a little strained; the features have a noble expression. The youthful character of the head does not accord with the rest of the body, in which the muscles are too strongly marked. This artist also exhibits a statue of Achilles wounded in the heel. Prize Medal. (Cat., p. 205, No. 710.)

L. MARCHESI, of Milan. Eurydice. In this figure, which is of marble, there is

something very pleasing in the general expression, but the execution of the details leaves much to be desired. Honourable Mention. (Cat., p. 205, No. 716.)

B. GRAPHIC DELINEATIONS ON PLANE SURFACES.

Enamel Painting.

NIGG. Painter in the Imperial Porcelain Manufactory of Vienna. The Holy Family, after a picture in the Imperial Gallery at Vienna, attributed to Raphael. In this copy the forms are rendered with tolerable fidelity, but the pale tone of the flesh very inadequately represents the warm powerful colouring of the original picture. The artist has succeeded better in a flower-piece, in which the colours of the flowers are most carefully rendered in all their original truth and force. Honourable Mention. (Cat., p. 203, No. 615.)

Painting on Glass.

G. BERTINI, of Milan. A design, in the centre of which the poet Dante is represented seated; on his right hand is Matilda, on his left Beatrice. This picture is set in an architectural frame, in the Gothic style. It is very seldom that we find in glass painting so much artistic expression as has been attained in the figures, more especially the female figures, in this work; and their effect is heightened by the remarkable harmony of the deep soft colouring. But, on the other hand, the architectural frame is utterly at variance with the taste and principles of construction in Gothic architecture; and two great black spaces, in the upper part of the picture, have a very disagreeable effect, from their contrast to the rest of the design, which is meant to produce the impression of a picture. From the arbitrary mixture of the Architectonic and Pictorial systems of glass-painting in this work, its effect as a whole cannot be agreeable to the best judges. Prize Medal. (Cat., p. 11, No. 737.)

P. BAGATTI VALSECCHI, of Milan. A painting on glass, representing Lucia Mondella, the heroine of Manzoni's celebrated romance, the "Promessi Sposi." As a specimen of *genre* painting on glass, this work is very remarkable in drawing, colour, general effect, and manner of execution. Honourable Mention. (Cat., p. 203, No. 616.)

Lithochromy.

THE IMPERIAL PRINTING OFFICE OF VIENNA. The work, "Paradisus Vindobonensis," exhibited by this establishment, contains a great number of lithographs of flowers and plants, which are represented in form, colour, and every other respect, with remarkable truth to nature. Prize Medal. (Cat., p. 199, No. 362.)

ITALY.

The Italian sculpture of the present day cannot be described as possessing any one general character; some of the modern school still imitate the style of Canova, as, for instance, Bienaimé; others, again, like Tenerani, follow rather in the steps of Thorwaldsen; others, like Marochetti, have devoted themselves, in conception and representation, to the romantic school.

SARDINIA.

D. W. BARON MAROCHETTI. This artist, though educated in France, and at present settled in England, is by birth a subject of the King of Sardinia, so that it

is most proper to place him under the latter country. He exhibited a colossal equestrian figure of Richard Cœur de Lion, modelled in plaster and bronzed, and placed in the open air at the west end of the Building. Richard is represented in mail, mounted on a fine charger. The frank and noble conception of the chivalrous king, holding up his sword in his right hand, and the spirited action of the horse, make this a very remarkable work. In some parts, however, of the modelling of the horse there is a want of knowledge. The hind quarter and hind legs, especially, have rather a lame appearance, and the execution of this part of the horse is very imperfect; the disposition of the veins particularly is altogether arbitrary. The artist has, however, exhibited within the Building a horse's head finished in detail, and from this sample we may see that certain further modelling may much improve the general effect. Council Medal. (Cat., p. 8, No. 76.)

NICOLAS LENDY, engraver at the Royal Mint of Turin. This artist exhibited nine microscopic dies of coins as examples of a process invented by himself, by which dies may be reduced with extraordinary accuracy to a scale, the minuteness of which is hardly credible.

Though the inscription and design on these dies can only be discerned by the aid of a very powerful microscope, the details are rendered with extreme fineness. (Cat., p. 301, No. 60.)

TUSCANY.

Among the works exhibited by this country are a Bacchus by NENCINI (No. 108), a Psyche by FRECCIA (No. 110), and a Dying Gladiator by COSTOLI, all in marble. These three works, though not without merit, must be reckoned of very subordinate rank, when we remember the great celebrity of Tuscany in art; they have, however, received Honourable Mention.

Sculpture on a small Scale.

A wardrobe and jewel-casket, by BARBETTI, of Siena, are, both in taste and execution, most remarkable examples of the rich style of decorative carving of the sixteenth century, commonly known as the cinque-cento style; though these works, therefore, have already obtained a Prize Medal, in Class XXVI., they cannot pass unnoticed here.

L. BIGOTTI. The ornaments carved in ivory by this artist show a good taste, and are carefully executed. Honourable Mention. (Cat., p. 319, No. 78.)

GRAPHIC DELINEATIONS ON PLANE SURFACES.

Inlaid Works in Pietra Dura.

This kind of art has been carried to great perfection in Tuscany, and its cultivation there for so long a period has supplied most of the palaces in Europe with works in pietra dura, which rank among the finest examples of decorative furniture.

No first-rate specimen was contributed to the Exhibition; there are, however, several table-tops by G. BIANCHINI, which must be considered very remarkable works, on account of the taste displayed in the composition of the flowers and leaves, and the care bestowed on the execution. They, therefore, received a Prize Medal from the Jury of Class XXX., as well as from that of Class XXVII. (Cat., p. 320, No. 113.)

ROME.

Sculpture on a large Scale.

It is to be regretted that the most distinguished artists of Rome, and especially Tenerani, the greatest living sculptor of Italy, sent no specimens of their works to the Exhibition.

Two groups, of a little girl with a dog, by G. M. BENZONI, may be noticed here. In one of these, the child is represented drawing a thorn out of the dog's foot; in the other, the dog, after having killed a snake which was threatening an attack, seeks to awaken the child thus rescued. The motive of these works is attractive, and they are carefully executed in marble, but they are by no means of sufficient importance to be considered adequate representations of the modern school of sculpture of such a city as Rome. Prize Medal. (Cat., p. 295, No. 16.)

I. ENGEL, of Hungary. A group in marble, representing an incident in the myth of the Argonauts and Amazons. This composition is not happy in its lines, and the figures are somewhat deficient in character, but the execution is careful. Though this artist is not an Italian by birth, yet, as he received his artistic education in Italy, this seems to be the most proper place for the notice of his work. Honourable Mention. (Cat., p. 8, No. 15.)

Cameos.

Fair specimens of this kind of art, which has been so much esteemed at Rome, and cultivated with such great results, have been contributed to the Exhibition in a series of cameos, cut on shells, by the well-known gem-engraver Saulini. The greater part of these are copied from the most attractive works of the celebrated English sculptor, Gibson. Honourable Mention. (Cat., p. 295, No. 24.)

Mosaics.

This class of art, in which the artists of Rome have so long maintained the first rank, and produced such wonderful results, was far more abundantly and adequately represented in the Exhibition, than the other branches of Roman art which we have already noticed.

BARBERI. A table-top, on which are represented views of celebrated cities in Italy, such as Rome, Florence, Venice, Pisa, &c. These views are arranged in a border round the table; in the central area thus encircled is a representation of the sky. Both in the choice of the subjects of the views, and in the force and refinement of execution, this work is among the most remarkable specimens of mosaic that have been produced. There is, however, rather a want of taste in the form and colour of the ornaments which compose the outermost border of the design. Although this work has been distinguished by a Council Medal in Class XXVII., I have thought it necessary to notice it here, on account of its remarkable character as a work of art. (Cat., p. 295, Col. 1, No. 15.)

The Mosaic Manufactory at St. Peter's exhibits two excellent specimens by CASTELLINI. One of these, representing a colossal three-quarter portrait of Pope Boniface II., is an example of the ancient style of mosaic, intended for the decoration of churches, and for distant effect. The other specimen is a half-length



GRATITUDE.
(MARBLE)

BENZONI.



GODFREY DE BOUILLON.
(PLASTER)

SIMONIS.

portrait of St. John, by GUERCINO. This work shows with what wonderful precision a picture, executed in a period when technical knowledge had been fully attained, may be reproduced in mosaic, with a perfect rendering of the forms, colouring, and general effect. Prize Medal. (Cat., p. 295, No. 23.)

B. BOSCHETTI, of Rome, exhibits two mosaics for table-tops, remarkable for their taste and execution; these have obtained Honourable Mention. Awarded Prize Medal. (Class XXVII., Cat., p. 295, No. 17.)

Three Roman artists in mosaic, DOMINICO MOGLIA (awarded Honourable Mention, Class XXVII.), the CAVALIERE LUIGI MOGLIA (awarded Prize Medal, Class XXVII.), and ROCCHIGIANI, have severally contributed to the Exhibition views of the temples of Pæstum, this subject being a favourite one among the Roman mosaicists. These views are executed on a considerable scale. All these artists deserve praise for the truth and careful execution displayed in their works, but the mosaic of Rocchigiani is distinguished from the rest by the force of the effect, and depth and warmth of the colouring. An Honourable Mention has been bestowed on these three artists. (Cat., p. 295, No. 21, 20, 22.)

BELGIUM.

In this country, notwithstanding its moderate size, there is so general a diffusion of talent and feeling for the Fine Arts, that they have been more freely developed here than has been the case in other countries far greater in extent of territory. Hence within the last twenty-five years, side by side with the flourishing school of painting in Belgium, has grown up a school of sculptors, among whom are many distinguished names. In this school of sculpture a tendency to the picturesque, which is in conformity with the whole bent of the nation in art, manifests itself in the general character of the composition, and in a peculiar treatment of the surfaces, in which there is always a certain roundness and fulness, and sometimes an exaggerated development. In many ideal subjects this treatment has a very attractive effect, but in some of the works of Belgian sculptors the want of a proper feeling for bony structure in the representation of the figure, and the affectation of the motive, show that the style of Canova has exercised an unfavourable influence on this school. In portraiture the sculptors of Belgium have shown great ability; in this branch of art the whole Realistic tendency of the national mind has found free scope.

Nearly all the distinguished sculptors of this school sent works to the Exhibition, though in some cases it can hardly be thought that the merits of the sculptor were adequately represented by the specimens he contributed.

A. SCULPTURE AND WORKS OF PLASTIC ART.

Sculpture on a large Scale.

E. SIMONIS. A colossal figure of Godfrey of Bouillon on horseback, raising the banner with which he led the Crusaders to the Holy Land. Cast in plaster from the original in bronze, which is placed in the Place Royale at Brussels.

In this work the expression of the head is full of life and animation, the action very emphatic, the execution very careful. To compensate for the optical diminution which causes statues placed in the open air to appear meagre and deficient in

mass, the artist has in this group exaggerated the forms both of the warrior and the horse. This departure from nature has perhaps been carried too far, and the principles of Plastic Art have been thus lost sight of in the treatment of the surfaces. It may also be remarked that in the side view the form of the horse presents two lines which are too parallel, and by no means happy.

In his group representing Truth trampling on Falsehood, the same artist has shown power in the representation of delicate feminine forms, and the work is carefully executed. The subject, however, is not indicated with sufficient clearness. Two figures of boys, one of whom is crying over his broken drum, prove that M. Simonis has also been successful in that class of subjects called "genre," and which are altogether treated in a Realistic manner. Prize Medal. (Cat., p. 213, No. 464.)

C. A. FRAIKIN, of Schaerbeck, near Brussels. A figure of Psyche moving lightly forward, and bearing a Cupid on her shoulders. The motive of this figure is spirited, the forms are expressed with great tenderness, and the group presents attractions from several points of view. There is, however, in the movement of the head of Psyche something affected, and in the style of Canova. Prize Medal. (Cat., p. 213, No. 465.)

G. GEEFS, of Schaerbeck, near Brussels. A group, in which the power of beauty over savage nature is allegorically represented by a lion, who is allowing his claws to be cut by a pretty undraped female figure. This work, of which a cast is exhibited in plaster, is very carefully executed as a whole; the forms of the female figure are very pleasing, though the treatment is rather too soft.

The bust of His Majesty the King of the Belgians, exhibited by the same artist, is very spirited, and is carefully executed. Prize Medal. (Cat., p. 213, No. 466.)

J. TUERLINCKX, of Malines. A figure, in marble, representing the celebrated Giotto, when a boy, looking at his first drawing with an expression of joy. The conception of this work is very spirited, and it is carefully executed. Prize Medal. (Cat., p. 213, No. 456.)

C. GEERTS, of Louvain. This artist, the most distinguished for wood-carving in Belgium, executed the carvings for the new stalls in Antwerp Cathedral. His chief contribution to the Exhibition is a "Coronation of the Virgin," executed in wood. In this work the artist shows a great knowledge of the Gothic style in the motive of the figures, the expression of the heads, and the manner in which the folds of the drapery are disposed. There is, however, somewhat too much of systematic uniformity in the character of the heads and drapery. Prize Medal. (Cat., p. 213, No. 450.)

JOSEPH GEEFS, of Antwerp. "The Faithful Messenger." In the work so entitled the sculptor has represented a dove perching on the shoulder of a young girl, to whom it has returned. This statue is very pleasing, but is hardly a work of sufficient consequence to give an idea of the distinguished merits of this artist. Honourable Mention. (Cat., p. 213, No. 451.)

J. JAQUET, of Schaerbeck, near Brussels. A group, in plaster, of Cupid asking Venus to restore his bow, which she has taken from him. This work is pleasing, though somewhat affected in motive. The execution is careful, though the development of the muscles, particularly on the back and shoulders, is too strong. Honourable Mention. (Cat., p. 213, No. 461.)



GIOTTO.
(MARBLE)

TUERLINCKX.



CARVINGS IN OAK.

GEERTS.



PSYCHE.

PRAIKEN.



PSYCHE AND CUPID.

FRAIKEN.



LION IN LOVE.

(PLASTER)

ORFÈS.

Sculpture on a small Scale.—Medals.

L. J. HART, of Brussels. Thirty-nine Medals, among which a portrait of Rubens may be particularly noticed. These works show very considerable skill in the class of art in which they are executed. Honourable Mention. (Cat., p. 213, No. 441.)

C. JEHOTTE, of Liège. A series of Medals by this artist are also skilfully executed. Honourable Mention. (Cat., p. 213, No. 447.)

B. GRAPHIC REPRESENTATIONS ON PLANE SURFACES.

Inlaid Works in Metal.

J. FALLOISE, of Liège. A shield, some drinking cups, a vase, an armlet, all in steel, inlaid with silver. The masterly execution, refined taste, and correct style shown in these works, place M. Falloise in the first rank in the class of Workers in Metal. Prize Medal. (Cat., p. 212, No. 384. Awarded Prize Medal, Class XXIII.)

SWITZERLAND.

J. LEEMANN, of Zürich, a bookbinder. The model of the Cathedral of Strasburg, executed in cardboard with a penknife. This model deserves special notice, on account of the correctness of the proportions, and the labour and dexterity shown in the execution. Honourable Mention. (Cat., p. 313, No. 257. Awarded Prize Medal, Class VII.)

J. LEEMANN, of Berne.* The model of the beautiful Fountain at Nuremberg, executed in wood with the utmost truth of detail. Honourable Mention. (Cat., p. 313, No. 258.)

SPAIN.

Inlaid Works.

(a.) In Wood.

PEREZ and Co. A manufactory for inlaying wood at Barcelona. A table-top, inlaid with a variety of ornaments, in the centre of which are the Royal Arms of Great Britain. The patterns, with a few exceptions, are in admirable taste, the colouring exquisite throughout, the execution of extraordinary fineness, the most minute particles of wood being employed to express the faintest gradations of colour. Altogether this is a work of the highest rank in its class. Prize Medal. (Cat., p. 307, No. 271A.)

(b.) In Metal.

E. ZULOAGA. The proprietor of an establishment at Madrid for works in metal, from which were exhibited various specimens executed in iron, inlaid with gold and silver, and ornamented with reliefs. These works are of rare excellence in every respect, both as regards the taste of the patterns and the artistic style of the execution. Among the most remarkable are a chest, worthy to receive the muniments of the proud nobility of Castile, two pairs of pistols, a couteau de

* It has been already pointed out, in the Report of Mr. Panizzi, that the model of the Fountain of Nuremberg is executed by the same artist as the model of Strasburg Cathedral which precedes it.

chasse, and a sabre. Honourable Mention. Awarded Prize Medal, Class XXIII. (Cat., p. 307, Nos. 264 and 264A.)

THE ROYAL ORDNANCE MANUFACTORY OF TOLEDO exhibits a number of works inlaid in the same manner, among which may be particularly noticed a dagger. Honourable Mention. (Cat., p. 307, No. 266.)

DENMARK.

Sculpture on a large Scale.

It was for this country that the great Thorwaldsen embodied his spiritual conceptions in such a number of masterpieces of sculpture ; and there are not wanting in Denmark at the present day distinguished sculptors who follow in his footsteps with greater or less success.

J. A. JERICHAU, of Copenhagen. Group of a Panther and Hunter. The animal has fastened on the hunter as he is carrying off one of her cubs ; he is about to pierce her with his spear.

This group is full of life, and finely conceived, the execution shows great knowledge, and careful minute labour in the details. It should, however, be noticed that the artist has missed the true proportions in the legs of the hunter, which are too short.

Another group, by the same artist, "Eve after the Fall," leaning on the seated figure of Adam, has great merit. Equal praise is due to him for a bas-relief intended to form part of a frieze ; a drawing of the whole design gives a very favourable impression of it. Prize Medal. (Cat., p. 217, No. 39.)

H. W. BISSEN, of Copenhagen. A figure of Orestes in rapid movement, and brandishing a sword. In this work the conception is full of life, and the momentary character of the action well rendered ; the expression of the countenance is noble, the execution careful. Honourable Mention. (Cat., p. 217, No. 38.)

Sculpture on a small Scale.

C. G. KLINGSEY, of Copenhagen. A jewel casket in ivory, ornamented with reliefs, after celebrated works by Thorwaldsen. The artist has shown a highly cultivated taste and correct feeling for style, not only in the general form of this casket, but in the adaptation of the reliefs to so small a scale, and in the architectural ornaments. This work is also to be especially commended on account of the great care shown in its execution. Honourable Mention. (Cat., p. 217, No. 34.)

RUSSIA.

It is to be regretted that Russia has contributed to the Exhibition no specimen of sculpture on a large scale, although we could here mention two distinguished Russian names—that of R. M. Von Launitz, now residing at Frankfort, a sculptor full of talent ; and the well-known Baron Kloth, of St. Petersburg, who in the representation of horses studied from the life, is one of the most distinguished artists of modern times. His groups of horses, with their trainers, at St. Petersburg and Berlin, may be cited in proof of his merits.

Count TOLSTOY, President of the Royal Academy of Arts at St. Petersburg,



GREEK SLAVE.
(MARBLE)

POWERS.

exhibits plaster casts of a series of medallions, on which are represented in relief the incidents of the successful war carried on by Russia against France, from 1813 to 1814. These works are well known to all connoisseurs, and deserve notice on account of the invention shown in the designs, some of which are very happy; the execution is also careful. Honourable Mention. (Cat., p. 300, No. 328.)

N. KORNILOFF, a painter in the Imperial Porcelain Manufactory of St. Petersburg, exhibits a copy of a landscape with cows, by Berghem, in which the characteristics of this master, both in form and colour, are rendered with remarkable truth and admirable execution of the details. Prize Medal. (Cat., p. 300, No. 318.)

Lithochromy.

F. DREGER, of Moscow, for an illustrated work, in which furniture and other examples of mediæval decoration are represented in a very masterly manner. Honourable Mention. (Cat., p. 300, No. 362.)

It is to be regretted that so distinguished an artist as Fogelberg, now living at Rome, did not contribute any work to the Exhibition on behalf of the school of his native country, Sweden; and that in like manner the Netherlands were not represented by Roger, the Director of the Academy of Art at Amsterdam, an admirable sculptor in the Realistic style. The works of both these artists would have shown the great excellence of the respective schools of sculpture to which they belong.

THE UNITED STATES OF AMERICA.

The American States, which in the course of a few generations have established so vast a scheme of municipal and political institutions, have attained to great perfection in many branches of industry, and are now beginning to turn their attention to the sciences, and also to those arts which minister to the spiritual rather than the animal wants of man, and which have for their high purpose the investigation of truth, and the expression of beauty through form.

All who have truly at heart the advancement of civilization, and regard it as the common good of mankind, must sincerely rejoice at the success which has attended this new movement of the American mind.

Sculpture on a large Scale.

Several natives of the United States may be mentioned who have attained proficiency in this difficult branch of art, which cannot be acquired without a certain course of training. I am acquainted with the works of two American sculptors, Greenough, and Hiram Powers, of whom the latter alone contributed to the Exhibition, and was only represented there by two specimens of his works:—1. The Greek Slave. In this work a youthful creature of very delicate form is represented in marble. The figure is studied from the life, and exhibits an extraordinary refinement of imitation. The treatment of the back, especially, is one of the happiest efforts in modern sculpture. It should be noted, however, that the manner in which the right hand of this figure is made to lean on the trunk of a tree, while at the same time the real support of the body is on the left leg, gives an appearance of uncertainty to the motion of the whole figure, and deprives it of that charm of contrast, which the sculptors of antiquity imparted to their

statues by throwing the weight of the figure decidedly on one side, so as to leave the other side free. It may be added, that the expression of gentle endurance and resignation which characterizes the head by no means serves to indicate the subject represented by this figure; the sculptor has, therefore, been obliged to have recourse to the symbol of the marble chain, to justify more fully the title which he has given to this work. 2. A Fisher Boy, listening attentively to the murmur of a shell. A youthful refined figure, sculptured in marble; the execution is careful, but not equal to that of the Greek Slave. Prize Medal. (Cat., p. 11, Nos. 522 and 547.)

Fine Art Casting.

The art of casting sculpture in different metals is obviously of the greatest importance for the diffusion of the finest works. I should not be therefore justified were I to pass over the specimens of Fine Art casting in the Exhibition, though these have been already examined and rewarded by the Jury of Class XXII.

The following artists and directors of foundries may be particularly noticed:—

(a.) Castings in Bronze.

ENGLAND. The COALBROOKDALE COMPANY, in Shropshire. The cast of Bell's figure of the Eagle-slayer shows great perfection, both in the casting and subsequent tooling.

J. A. HATFIELD, of London. "Foley's Youth at the Stream." This work is deserving of notice, as a remarkable specimen of casting.

ZOLLVEREIN. The foundry of Count G. EINSIEDEL, of Lauchhammer, in Prussian Saxony, exhibits a great number of large and important specimens of casting. Among them may be especially noticed the figure of a Girl at the Fountain, by Wichmann, a very good example of casting and tooling.

FRIEBEL. This artist has executed, at Berlin, the whole of the casts of Rauch's monument of Frederick the Great. A Newfoundland Dog, after a model by Moller, and remarkably well cast and tooled, and a number of smaller figures, were exhibited by this artist.

C. U. FISCHER, of Berlin. This artist also exhibited a great number of casts, among which may be especially noticed an Eagle, and a Danaid, after Rauch.

KESLER, of Greiswald. The figure of the Muse Polyhymnia, in the Royal Museum at Berlin; a very successful specimen of raw casting.

MILLER, director of the celebrated Royal Bronze Foundry at Munich, an establishment which has accomplished much under his management, and which under its late director, Stiglmayer, had already produced such an abundance of castings, and on so colossal a scale.

Those executed by Miller are the Lion, which has been already noticed in this Report, and the two noble figures by Schwanthaler, the first of these being a specimen of raw casting, and the two figures being tooled.

These works are most admirable for the sharpness and clearness of the casting, and also for the beautiful subdued colour of the bronze.

FRANCE. ECK and DURANT, of Paris. The Dancing Satyr, by Lequesne; an excellent cast, well tooled.



ANDROMEDA.
(BRONZE)

BELL.



STATUE OF HER MAJESTY.
(ZINC)

VIEILLE MONTAGNE COMPANY.

QUESNEL, of Paris. The Venus and Cupid, by Pradier, and the group of a Hunter killing a Stag, by Jean Debay, are also well worthy of notice.

SIMONS and SONS, of Paris. The Bust of a Negro, by Cordier; a masterly specimen both of casting and tooling.

(b). *Castings in Zinc.*

ZOLLVEREIN. M. GEISS, of Berlin. In the establishment of this artist the casting of zinc has been brought to remarkable perfection, and works of sculpture, of a colossal and of the smallest scale, as well as architectural ornaments of the most refined taste, have been reproduced in this material.

By a process recently introduced, copper is deposited on the zinc by galvanic action; a bronze surface is thus produced, which is as beautiful as it is durable. The Exhibition contained the following admirable examples of the casting of this establishment:—The Amazon, by Kiss; the Hebe, by Canova; the Boy with the Swan, by Kalide; Baily's Eve; the celebrated figure in the Glyptothek at Munich, known as the "Ilioneus," or the "Niobid;" two Stags, by Rauch; also a Corinthian and an Ionic Capital.

I am of opinion that the Council Medal was quite as fully deserved by this establishment as by that of the "Vieille Montagne."

SP. DEVARANNE and SON. This firm has also brought the art of casting in zinc to great perfection, and exhibited a number of works of the same kind as those contributed by Geiss.

Out of this great collection the following may be mentioned as most worthy of notice: the Venus, by Canova; a Lion and a Panther, life-size; and the Danaid, by Rauch.

BELGIUM. The establishment called "La Vieille Montagne," in Belgium, which has produced a number of zinc castings of remarkable excellence, has exhibited one most masterly specimen, Her Majesty Queen Victoria, seated on her throne.

(c). *Castings in Iron.*

ENGLAND. The COALBROOK DALE COMPANY. A very successful cast of Bell's Eagle-slayer.

ZOLLVEREIN. The ROYAL IRON-FOUNDRY, of Berlin. The great importance of this establishment has been already pointed out in the notice of the several specimens exhibited by it. The process of Galvanoplastic deposit may be here also noticed, as another mode by which sculpture may be reproduced with accuracy, and at a reasonable cost.

JULIUS WINCKELMANN, proprietor of a Galvanoplastic establishment in Berlin. The statue of Frederick William II., Elector of Brandenburg. This work is very remarkable on account of the great sharpness of the forms.

C. WAAGEN, *Reporter*

November 1851.

SUPPLEMENTARY REPORT ON DESIGN.

BY RICHARD REDGRAVE, R.A.

IT was the original intention of Her Majesty's Commissioners that all exhibited " Designs " should be referred to the consideration of the Juries of the respective Classes to whose award the *fabrics* to which such designs were applied, or intended to be applied, were submitted. It was subsequently determined that it would be more advisable that this duty should be undertaken by the Jurors of Class XXX., assisted by associated Jurors from the various Classes of manufactures designed for. The awards on design will therefore be found among those of the Jury of Class XXX.

With a view to the permanent record of the opinions formed on the careful examination entailed by their duty, Her Majesty's Commissioners directed a Report to be drawn up by one of the members of the Jury, which should not be limited to the merits of the " Designs " exhibited, but should have regard to the general state of design as applied to the various fabrics and manufactures in the Great Exhibition.

Such then are the objects to be embraced in this Report, and they form an extensive and onerous duty to be fulfilled by any one individual. When the varied applications of design and ornamental decoration called for by the different uses, materials, and modes of manufacture are considered, and the vast multitude of objects to which they are applied (all more or less requiring examination), the task of the Reporter will be seen to be one of great difficulty and labour, in the execution of which he trusts peculiar indulgence may be claimed.

The desire evinced by the rudest as well as the most civilized nations for the decoration of their buildings, utensils, and clothing, almost raises ornament into a natural want, and must render its proper application of the utmost consequence to the manufacturer, since upon it the value of his manufactures in the various markets of the world greatly depends. It can hardly be possible, therefore, that any one should doubt, on the present occasion, the importance of a careful review of the union of design and ornament to manufacturing skill, since all that the inventive powers, the fancy, and the handicraft of man can do has this year been gathered into one place, and the world been invited to consider and examine it. But without some critical guidance, some judicial canons, or some careful separation of the meretricious from the beautiful, it is to be feared that the public taste will rather be vitiated than improved by an examination of the Exhibition, as it will readily be allowed that the mass of ornament applied to the works therein exhibited is of the former character, and from that very cause more likely to impose on the uninformed taste of the multitude than the simpler qualities of real excellence to impress us with a just sense of their worth. Such considerations were, doubtless, among the reasons which influenced the determination of the Royal Commissioners on this subject.

We have spoken of design and of ornamental decoration. These are two essentially different things, and it is highly necessary that they should, from the

first, be considered as separate and distinct. "Design" has reference to the construction of any work both for use and beauty, and therefore includes its ornamentation also. "Ornament" is merely the decoration of a thing constructed.

Ornament is thus necessarily limited, for, so defined, it cannot be other than secondary, and must not usurp a principal place; if it do so, the object is no longer a work ornamented, but is degraded into a mere *ornament*. Now the great tendency of the present time is to reverse this rule; indeed it is impossible to examine the works of the Great Exhibition without seeing how often utility and construction are made secondary to decoration. In fact, when commencing a design, designers are too apt to think of ornament before construction, and, as has been said in connexion with the nobler art of architecture, rather to construct ornament than to ornament construction. This, on the slightest examination, will be found to be the leading error in the Exhibition, an error more or less apparent in every department of manufacture connected with ornament, which is apt to sicken us of decoration, and leads us to admire those objects of absolute utility (the machines and utensils of various kinds), where use is so paramount that ornament is repudiated, and, fitness of purpose being the end sought, a noble simplicity is the result.

The primary consideration of construction is so necessary to pure design, that it almost follows that, whenever style and ornament are debased, construction will be found to have been first disregarded; and that those styles which are considered the purest, and the best periods of those styles, are just those wherein constructive utility has been rightly understood and most thoroughly attended to. A dissertation upon difference of styles would be out of place in this Report, as well as an expressed preference for any particular one, since each, doubtless, contains some qualities of beauty or excellence which will justify its use when restrained and regulated by fixed principles. It may not, however, be improper to illustrate by a few remarks the opinion expressed above, since it involves important principles connected with a proper consideration of works coming within the scope of the Report.

To begin with the ecclesiastical architecture of the middle ages: when the style was purest, the construction was most scientific, the arches were best formed for resistance, the groining elevated and simple, the ornament modest and applied to the forms of construction only. As the style progressed with time, it departed from its primitive simplicity: it became more ornamental, it is true, but at the sacrifice of some of its constructive truth: the use of the arch was partly obscured by its being placed under a horizontal arrangement, and supported by perpendicular mullions, and it was gradually flattened to the worst form for sustaining pressure. The groining, at first simple, became a most elaborate system of reticulation, by its numerous lines reducing the apparent height of the roof, to the entire loss of the sublime effect produced by its elevation and simple groining in the earlier period. At the same time the enormous pendants seemed ready to fall on the heads of the beholder, and to bring with them the flattened arch of which they were the key-stones. The exterior was everywhere decorated, effecting the ruin of the building by the dust and moss which this humid climate soon engendered. In its last period, decoration could be carried no further, and Gothic architecture, which had grown into glory and beauty, from its just and

scientific construction, was thrown aside when a florid ornamentation had taken the place of constructive truth. It was succeeded in this country by the Tudor style, a modification of the Renaissance. The Renaissance itself arose mainly from the study of Roman remains, and those often of the worst period of the Empire, when Greek science, skill, and pure taste had fallen before Roman magnificence and barbarism, and before modern discoveries had opened up the Athenian treasures of Greek art. It was introduced, however, by men of enlarged minds, most of them great constructive architects, and by them it was constructively adapted; they embodied in it many of the just principles of the ancient styles; and if the stream of tradition had brought down much rubbish as well as treasure, still the master minds of the fifteenth century gradually separated them, and applied with unrivalled skill and a fertile fancy what was beautiful and good. It was, however, essentially pagan in all its details, and its ornament conveyed no symbolic truths to the hearts of men. In the hands of less skilful masters it soon became decoration without a pervading spirit, ornament merely used as ornament, without propriety as without meaning; and thus, as the Tudor style, it succeeded in this country to the Gothic, that style dying out, partly from the causes above stated, and partly from the change of feeling consequent on the reformed opinions which then prevailed. This debased form of the Renaissance, in its decoration, had already cast off all constructive truth and consistency: much that was bad in the late style was retained and mixed with it; whatever was good was as certainly forgotten. Columns were reversed, the heavy and broad part being upwards, the small part below; they swelled alternately into enormous bands, and were contracted into severing rings, and sometimes they stood upon balls to give a further sense of insecurity. Terminal figures were introduced which had the weight of their entablatures borne on baskets of imitative fruits or flowers. The covering pediments were broken, contrary to all constructive application, or were placed successively one within another: entablatures were enlarged out of all proportion to the supporting columns; and the useful was superseded by the ornamental.

In France first, and afterwards in all the countries of Europe, the Renaissance was degraded into the style known as that of Louis Quatorze. In all that this style differed from the true Renaissance, it differed merely as arising out of decoration. As a style it never had a commencement in construction, as the Gothic and Renaissance had, both of which were founded on an architectural basis; *this* sprang from the love of the Grand Monarque for magnificence and display. In it, all that was constructively true was disregarded utterly and systematically; thus supports became curved and broken in line exactly where they required strength, bearing-rails were severed in the centre where the greatest bearing was, the union of horizontal and perpendicular forms was suppressed, styles and rails as far as possible hidden, veneers applied with the grain across the framing, and every effort of invention strained, not to decorate the due constructive truth of things, but utterly to hide and abolish construction altogether. The ruling principle of the style, as far as it can be said to have had one, was the avoidance of symmetry, and the search after variety by every possible means: for this reason central forms had disymmetrical sides, and the most unequal division of parts was the rule of composition. Nevertheless, for the purpose which called it forth, for mere mag-

nificence and display, it was admirably adapted, being one of the most suitable styles for the display of gilding, and for brilliancy and sparkle in metal and or-molu work, showy and glittering beyond anything attainable in the simpler forms of the Renaissance or of classic antiquity. From these qualities it has long maintained its hold on the public taste ; and its florid and gorgeous tinsel still prevails in three-fourths of the works of the Great Exhibition, notwithstanding its gross contempt of constructive principles.

The ornament of past ages is the *tradition* of the ornamentist, and tradition ever hands down to us things good and bad, both equally consecrated to most minds by the authority of time. But a moment's reflection will show how necessary it is to discriminate before receiving anything on such authority. A church or temple built in a rude age remains undisturbed by some happy chance, a villa or a theatre in a remote provincial town escapes the fatalities of accident or time, some tomb is opened, some overwhelmed city exhumed from the *débris* of ruin that had gathered over it. The ornamental details found therein are copied and illustrated by the notes of antiquarians, or published in the proceedings of learned societies, and are at once regarded as authorities for imitation, it being forgotten that they were perhaps the works of obscure provincial artists, of a barbarous age perchance, or of a people with whom *art*, no longer studied for its principles, had ceased to progress or had rapidly declined.

Such traditional ornament moreover had or had not a local use, a consistent application to domestic, ecclesiastical, or funeral purposes, in fact a local symbolism ; but even if it had, this, mostly overlooked, is sure to be soon disregarded ; and not only have we ornament of a degraded period, of a declining age, or by inferior artists, but to this must be added, that its symbolic life is totally extinct, and, perhaps, fortunately so, for when revived it is indiscriminately used, for purposes totally at variance with its first application and original intent. Moreover, the ornament suited for one material is misapplied to a material different from that for which it was designed. Thus ornament originally carved in stone is used for metal or for wood, or, worse still, for carpets or for dresses. That which was intended to be carved in relief is imitated as the inlay of a floor or the hanging of a wall, and senseless anomalies of all kinds speedily arise from undue reverence for and indiscriminate use of traditional ornament. That this is no forced view of things, a glance at the Exhibition will at once show, wherein are to be seen the sacred vessels of the church imitated for secular purposes ; the funeral urns of the Greek revived as drinking-vessels for the table ; the columns of temples turned into candlesticks, and sarcophagi into wine-coolers ; while the decorations of ceilings are applied to carpets, and the carved frieze of an Ionic temple to a muslin curtain : all these errors arising from the indiscriminating use of those materials with which antiquity has supplied us.

Ornamentists may fairly be divided into two classes : the traditional, who superstitiously reverence the remains of past ages and are wedded in practice to existing styles ; and those who despise the past and feel themselves at liberty to adopt from the abundant sources of nature a mode and manner for themselves, without regard to the works of their predecessors. The first class simply seek to follow where precedent leads them, and to be able to claim the sanction of authority for their works. These, even when taste duly regulates their choice, are men of limited

ideas and small progress. Those of the second class, who pay no deference to authority, who think that ornament is governed by no laws, and who see no principles by which they are to be guided, are little likely to raise the art to the level of past times, and, still less, to advance its aim and widen its scope. The true ornamentist would seem to be one who seeks out the *principles* on which the bygone artists worked, and the rules by which they arrived at excellence, and, discarding mere imitation and reproduction of details, endeavours, by the application of new ideas and new matter on *principles* which he believes to be sound, or which time and the assent of other minds has approved to be fundamental, to attain originality through fitness and truth. The antiquarian ornamentist, however, will always have a certain reputation, and justly, if he has the taste to select what is best from the great masters of past times. In any case the critic must be bold who speaks against the authority of the fathers of the art; and praise is safe when great names are on the side of the critic. From this class of ornamentists we may at least demand purity of style, that marked eras should be kept distinct, and that the adopted ornament should be fitly applied to fabrics or manufactures of the like nature, and, as far as possible, for the like uses, as those for which the ornament was first designed.

From the labours of the second class of ornamentists, united to that constant search after novelty at any sacrifice of true taste for which manufacturers are so constantly urgent, there has arisen a new species of ornament of the most objectionable kind, which it is desirable at once to deprecate on account of its complete departure from just taste and true principles. This may be called the *natural* or merely imitative style, and it is seen in its worst development in some of the articles of form.

Thus we have metal *imitations* of plants and flowers, with an attempt to make them a strict resemblance, forgetting that natural objects are rendered into ornament by subordinating the details to the general idea, and that the endeavour ought to be to seize the simplest expression of a thing rather than to imitate it. This is the case with fine art also: in its highest effort mere imitation is an error and an impertinence, and true ornamental art is even more opposed to the merely imitative treatment now so largely adopted. Let any one examine floral or foliated ornament produced in metal by electrotyping the natural object, whereby every venation and striation of the plant is reproduced, and compare it with a well and simply modelled treatment, where only the general features of the form are given and all the minutest details purposely omitted; and if this latter has been done with a true sense of the characteristics of the plant, the meanness and littleness of the one mode will be perfectly evident, compared with the larger manner of the other. But this imitative style is carried much further: or-molu stems and leaves bear porcelain flowers painted to imitate nature, and candles are made to rise out of tulips and chinaasters, while gas jets gush forth from opal arums. Stems, bearing flowers for various uses, arise from groups of metal leaves standing tiptoe on their points, and every constructive truth, and just adaptation to use, is disregarded for a senseless imitative naturalism. In the same way, and doubtless supported by great authority, past and present, enormous wreaths of flowers, fish, game, fruits, &c., imitated *à merveille*, dangle round sideboards, beds, and picture-frames. Glass is tortured out of its true quality to make it into the cup of a lily

or an anemone : not that we may be supposed to drink nectar from the flower, but that novelty may catch those for whom good taste is not piquant enough, and chaste forms not sufficiently showy. In fabrics where flatness would seem most essential, this imitative treatment is often carried to the greatest excess ; and carpets are ornamented with water-lilies floating on their natural bed, with fruits and flowers poured forth in overwhelming abundance in all the glory of their shades and hues ; or we are startled by a lion at our hearth, or a leopard on our rug, his spotted coat imitated even to its relief as well as to its colour, while palm-trees and landscapes are used as the ornaments of muslin curtains. Though far from saying that imitative ornament is not sometimes allowable, still it will at once be felt that the manner wants a determined regulation to exclude it in most of the above-mentioned cases from all works aspiring to be considered in just taste, and to leave it to be adopted by those only who think novelty better than chaste design, and show preferable to truth.

The constant search after novelty has just been alluded to as one of the sources of bad taste in modern ornament. Manufacturers are eager to obtain it at any sacrifice of truth, and at any cost. The efforts of those past ages, when taste was most indisputable, appear to have been directed rather to the continually perfecting and refining their designs and inventions, than to creating new ones. Thus in architecture the robust simplicity and grandeur of the Doric order remained unchanged from age to age, architect after architect striving only to perfect its just proportions and the symmetry of its parts, rather than to add any novelty of feature or ornament, until, in the Parthenon, it seems to have arrived at the most perfect development that taste, science, and art could unitedly effect. Even among the more voluptuous inhabitants of Asia Minor, at least until the age when their artists became servants and panderers to the coarser magnificence of Rome, the details of ornamentation were few, and those universally received. The volute, the acanthus, the anthemion, the echinus, and a few frets and guilloches, seemed to pass the ordeal of criticism, not that they might be rejected for more novel treatments, but that the symmetry of their parts might be more justly balanced, the commoner curves rejected for those more varied, beautiful, and refined, and the true import given to their projections. Proportion and symmetry being thus sought after instead of novelty, their ornament has come down to us with authority like that of Scripture, rather than of tradition, and all the after efforts of artists, who have adopted and adapted it, have failed to improve its elegance, or to add to its beauty. Even in the eastern nations we find the same usage prevail ; and to this day Indian ornament is composed of the same forms as it was in the earliest known works : the principles that governed ornamental practice in those works seem still to be a tradition with the artist and the workman, and still to produce the same beautiful results, as is abundantly seen in the fabrics and tissues of the Indian Department in the Great Exhibition. Now, however, our efforts are of an entirely different nature, and the hunger after novelty is quite insatiable ; heaven and earth are racked for novel inventions, and happy is the man who lights upon something, however *outré*, that shall strike the vulgar mind, and obtain the "run of the season." Such patterns as often result from the caprice of accident as from any effort of thought—witness what is called the diorama pattern in cotton printing, which was very popular, yet was the result of

an accidental folding of the stuff on the cylinder in printing. Accepted for the season, these fantasies no sooner pass away than the world wonders how it could ever have looked upon them with satisfaction, or tolerated for an instant such solecisms in taste, such strange incongruities, or gross absurdities.

The ornament of past ages was chiefly the offspring of handicraft labour, that of the present age is of the engine and the machine. This great difference in the mode of production causes a like difference in the results. In old times the artist was at once designer, ornamentist, and craftsman, and to him was indifferent the use of the pencil or the brush, of the hammer, the chisel, or the punch: his hand and his mind wrought together, not only in the design, but in every stage of its completion, and thus there entered a portion of that mind into every minute detail, and into every stage of finish, and many a beautiful after-thought was embodied by the hand of the "cunning artificer," many a grace added to the work by his mastery and skill. He worked, not to produce a rigid sameness, but as Nature works:—she produces nothing exactly similar to its fellow; in every turn of every stage of growth, in every flower, and in every leaf, adding a changing grace, a differing beauty; so he varied his labours with every feeling of his overflowing mind. But this is not possible with the stamp, the mould, the press, and the die, the ornamental agents of our days: after the type or model is made, all the products are rigidly the same, whence arises a sickening monotony, a tiresome sameness, unknown in the works of nature and peculiar to these artificial works of man: the varying mind has no share in their production, and man himself becomes only the servant of the machine.

Moreover, the old ornamentist worked generally from feelings of piety, from love of his labours, or from the desire of fame, motives hardly known to the artist of this class in our days, at least in this country—Who seeks fame from the ephemera of a season? Who loves a labour that is so soon to pass away? Who cares for a work that is not to be the child of his own hand, but to be produced in thousands by the aid of machinery? The toil of him of old times was spent upon the thing itself, and not upon a mere model for it: the chalice, the cup, the lock and key, the reliquary, were to be without repetition, and without rivals: he sought to give them their highest excellence, and, labouring from one of the feelings we have described, threw his whole soul into his work, so that it became a thing for future ages to look upon and to prize. Not that handicraft or art-workmanship is utterly excluded from our manufactures; it is only partially so, making more painfully evident how greatly ornamental art has suffered from its new union with machinery. Wherever ornament is wholly effected by machinery, it is certainly the most degraded in style and execution; and the best workmanship and the best taste are to be found in those manufactures and fabrics wherein handicraft is entirely or partially the means of producing the ornament, as in china and glass, in works in the precious metals, carving, &c. This partly arises from the facilities which machinery gives to the manufacturer, enabling him to produce the florid and overloaded as cheaply as the simple forms, and thus to satisfy the larger market for the multitude, who desire quantity rather than quality, and value a thing the more, the more it is ornamented. This state of modern manufacture, whereby ornament is multiplied without limit from a given model, by the machine or the mould, ought at least to awaken in the manufacturer a sense of the importance of the first

design. One would think that what was to be produced by thousands and tens of thousands should at least be a work of beauty, and no pains be spared to insure its excellence. The cost of the first design or model must in such a case be a mere atom when divided among its myriad prototypes. It would seem strange, too, that any one could be found to throw away great expense upon dies and moulds, to carry out a design which in itself was hardly thought worth paying for. Yet often in this country artists are paid little better than workmen, and a belief seems to prevail, that knowledge, skill, and taste come by nature: the artist has often no interest in the result of his labours, his name is unknown, his pay is niggardly, and what there may be of beauty and excellence in his work is often spoiled by the alterations of the manufacturer, who makes no scruple of setting his own taste above that of the artist, and altering and changing a design at his sole pleasure. In France, and some parts of Germany, where taste has long been cultivated, and the value of ornamental design is better understood, these relations are better understood also; and in this country, if good taste is to prevail, the manufacturer must learn to appreciate more highly the value of the designer's labours, must seek to foster his talents and stimulate his *amour propre*. Society also must be prepared to contribute more largely than heretofore to public education in ornamental art, and taste must be disseminated by every available means; for it is not only truth, but a truth that should be told, that, notwithstanding our skilful workmanship and our excellent manufacture of most fabrics, we are sadly behind in the design applied to them, and greatly indebted to foreign artists even for what little is good. Moreover our greatest difficulty consists even less in the want of designers than of skilled art-workmen to carry out designs. A design for cotton printing may be spoiled by the "putter-on," or for silk by him who prepares it for the loom. The sculptor may design a statuette, but there are few able to chase the bronze, or to retouch the clay, or to unite the parts when they come forth from the mould. Even where such are found, they are mostly men of slow minds, who enter little into the spirit of the artist's labours, and who work without feeling as without fire. We find plenty of chasers able to imitate the fur of animals, or the texture of draperies, but few who understand the bones and the anatomy of the parts, and fewer still who carry an artist's spirit into their works. In painting, also, the painter on glass and china is generally a mere copyist, or he works too entirely by rote, and without feeling. The lily and the rose which he paints are always the same lily and the same rose, a work of the hand and eye, in which the mind has no share. There are honourable exceptions, no doubt, but with the many art is a mere handicraft. In France, in Germany, in Bavaria, in Italy, this is not the case. There the artist often carries out his own design, and, where he does not, has always at hand a band of skilled art-workmen to embody his ideas, or to complete his labours. The beautiful works in metal by VECHE, WAGNER, and WEISHAUP, the china paintings of JACOBBER, SCHILT, DUCLUZEAU, HAMAN, and a multitude of others, and the furniture carvings of LIENARD, are choice examples of the above-stated truths; while the works in oxidized silver, such as seal and knife handles, paper-weights, cigar-cases, &c., exhibited by RUDOLPHI, with the bronzes of MÉNÉ, PRADIER, and a host of other such works, show the skill, taste and knowledge of the art-workmen of France. In France, moreover, there is a

fitness and fancy pervading ornamentation; the ornament, especially where figures and animals are introduced, being specially adapted to the thing ornamented. In England the ornament designed for one work is made to do duty for twenty others: one figure truly plays many parts, and is often used with an inconceivable want of fitness. But the English public, and the English manufacturers as a body, are hardly yet awake on the question of design: Government has established schools of ornamental art in many of our large manufacturing towns for the purpose of spreading genuine taste, and educating our workmen; but they are as yet a forced product, and have hardly anywhere, after ten years of struggle, won the warm support of the local manufacturer. Even in this Great Exhibition, the question of *design* was nearly overlooked, and the works of the designer left without a place: his name was not necessarily coupled with the fabrics or manufactures his skill had designed or decorated, and his reward therefore was left to the good feeling of his employer. No special Jury was named to unite with manufacturers in the various classes in judging of the taste and art displayed in the ornamentation of their fabrics; and that art which, as we have before said, is calculated, when excellent, to raise the reputation of a nation's manufactures, was left to the judgment of those too likely to consider, not its real excellence, but what an untaught multitude would purchase and would prize. In France many large establishments have well-appointed schools attached for teaching drawing and modelling, and the rudiments of science connected with their manufactures. In Germany also, and in Italy, schools and institutions have long been in operation for the cultivation of taste in design; and it will be necessary for this country to enter seriously on the same course, if we are to maintain even our manufacturing reputation before the world.

In estimating the progress of this country in ornament and in art-workmanship as compared with the continental nations, there is one circumstance that must enter largely into consideration. In France, Germany, Italy, and Belgium, in addition to schools for teaching ornamental art, royal and national manufactories have been established for many years. In these no necessary expense is spared to bring to perfection the fabrics wrought in them, both as to the highest excellence of workmanship and materials, and to their embellishment by ornamental design. The best painters, sculptors, and designers, as well as men of the most scientific acquirements in botany, mineralogy, and chemistry, are among their professors; and the works being carried on at the public expense for the attainment of excellence, the cost of repeated failures is unheeded. In such establishments a band of skilled workmen must of necessity be trained to the ultimate benefit of the private manufacturers, and those difficulties which science had found the means of overcoming, or those new processes and new materials which it had brought to light, be spread abroad for the common advantage of all. Moreover, the sight of excellence and of the products of skilled workmanship is one of the greatest stimulants to further exertion, since all art and all manufacture arrive at perfection by gradual advance on past labours. The workman who sees the results of the skill which has produced such works in china and porcelain as are exhibited in the Sèvres room or in the hall of the Zollverein, must feel this stimulus in no mean degree. When it is remembered what one single artist did in this country for the same manufacture, and how greatly Wedgwood

and his workmen were indebted to Flaxman, we can well feel what influence a band of artists of like ability, exercising their talents to improve every department of the manufacture, and of these a continued succession, would be likely to exercise over the taste and skill of those in contact with them. Nor is this all: the excellence of one fabric awakens a desire for like excellence in others, and calls forth the same spirit of emulation. It surely cannot be doubted, therefore, that the continental nations, and more especially France, in this manufacture, and through it in many others, have been largely benefited by such institutions; besides the amount of national reputation obtained by them from the display of the choice works which are therein produced.

In these remarks it is not intended to plead for the desirableness of such establishments in our own country, but only to point them out as the means whereby other nations have attained to great excellence. It is no answer to such an argument, although it is indeed true, to say that without these aids the *general* manufacture of such fabrics in Germany and France is behind our own; and that the private show of such works by MINTON, COPELAND, and others, is, both as to manufacture and design, superior to that of any private manufacturer of those countries. This may arise from various causes; but with the like advantages on our side it may well be imagined that much greater excellence would have been attained, the want of skilled art-workmen being felt and acknowledged by these manufacturers as a great hindrance to the complete success of their manufacture. Moreover, it is but fair to remember that such royal and national establishments, by the beautiful works produced in them, have added largely to the number of rewards won by other nations in this peaceful contention, and have placed at some apparent disadvantage the manufacturers and workmen of our own country. Let us hope, however, that the time is coming when England will seize eagerly every proper means of improvement. Symptoms of it are already abroad; and there seems a likelihood that the Great Exhibition of the Industry of all Nations will be valuable to all in showing short-comings as well as excellences; and to none will it be more so than to the British nation, if it awakens us to a knowledge of our deficiency in ornamental art, and to a hearty endeavour immediately to remedy it.

It has already been stated that this Report originated in the consideration of "designs." It is proper, therefore, that the works of the designer should be examined and commented on, before the manufactures to the construction or for the ornamentation of which they were intended to be applied. From the artists we have a right to expect that true taste, that scientific knowledge, and those sound principles, too often wanting in the manufactured works. The difficulties to be overcome in the various processes, or the limited resources of the manufacturer, together with the influence of the public taste on the demands of the market, *may* form some excuse for the manufacturer if his efforts are imperfect, or directed to sale rather than to excellence. But the designer has so long exclaimed against the bondage which has obliged him to please the public and the manufacturer at the sacrifice of his own better judgment, that he ought gladly to have seized on the present opportunity to exhibit a faith and practice of his own. Now at least he was at liberty to appeal to the few, and, untrammelled by any conditions, to exhibit his own powers, his own knowledge, taste, and better judgment, to lead

men to the appreciation of the simple and the chaste as the true source of the beautiful. Another reason for commencing with the examination of the works of the artists was, that if the stream was pure at the fountain, the blame would justly lie with those who afterwards defiled it; or, in plain words, if the designer were proved to have set a good example in his works, false taste, where found, might be placed at the door of the manufacturer; while, on the contrary, some allowance might be made for him if the authorized teacher were wanting in taste and true principles.

Before proceeding with the subject, however, it is necessary to arrange, under some general heads, the various works of the designer, and applications of design, which are to form the subject of this Report. The largeness of the field must be an excuse, if many combinations of design and manufacture are entirely overlooked, others very slightly alluded to, and all imperfectly considered. The many thousand specific applications of design, and the large number of classes and sub-classes into which the labours of the designer enter, render it impossible, in the time and space allotted for such a Report, to give more than a general *résumé* of the subject. The attempt, therefore, has rather been to arrive at general principles than to enter upon the examination of individual objects. At the same time, the principles that are found to guide the designer for one fabric are often so self-evidently applicable to others, that, even thus generalized, the Report has reference to numerous manufactures which have not been specially considered, and to many individual cases that do not range exactly under any one of the heads named in it.

The method adopted has been to declare the general principles, as far as they can be arrived at, which ought to govern the design and ornamentation of any fabric, to indicate prevailing errors and false taste, and to allude sparingly to such works of merit as seem wholly or largely composed with good taste and on sound principles.

The proposed classification divides itself under four general heads:—Decoration of Buildings—Domestic and other Furniture—Domestic Utensils and objects of Personal Use—Garment Fabrics.

The general heads will be again subdivided as follows:—

1. Decoration of buildings, consisting of—

- 1st. Architectural decoration, painted, &c.
- 2nd. Stone, carved wood, terra cotta, carton-pierre, and other relief decorations.
- 3rd. Stained glass.
- 4th. Inlaid floors, mosaic pavement, inlaid tiles, &c.
- 5th. Paper and other hangings.
- 6th. Metal-work.

2. Domestic and other furniture, including cabinet-work of all kinds, and furniture of all materials.

- 1st. Stoves, grates, fenders, lamps, gas-fittings, and other hardware.
- 2nd. Carpets, portières, table-covers, and floor-cloths.
- 3rd. Curtains and hangings.
- 4th. Table-linen.

3. Domestic utensils and objects of personal use—

- 1st. Porcelain, pottery, &c.
- 2nd. Table and ornamental glass.
- 3rd. Works in the precious metals and jewellery, clocks, &c.
- 4th. Bookbinding.

4. Garment fabrics—

- 1st. Woven in patterns of any material, and hand-worked.
- 2nd. Printed " "
- 3rd. Lace.
- 4th. Ribbons.

In reviewing these various classes it may happen that different materials, ornamented by the same means, and applied to the like uses, may be spoken of indifferently; or even varied uses may be comprehended under the same general remarks, where the same principles of ornamentation are strictly applicable, since the object in view is rather to include, and thereby shorten labour, than to maintain the nice distinctions necessary under the several class Reports.

DIV. 1.—*Decoration of Buildings.*

Architectural decoration, painted, &c.

Architectural decoration in carved wood, stone, terra cotta, carton-pierre, gutta percha, &c.

The objects in the Great Exhibition which range under the two first heads of this section belong to almost every known style of ornament, and are so various in their character and uses that it is hardly possible so to arrange them as to bring them under general criticism, or to define any principles which would be universally applicable to their design. They consist, 1st, Of decorative treatments exhibited as efforts of skill. 2ndly, Of restorations of parts of buildings, and of ornamental constructive parts. And, 3rdly, Of works intended to form integral parts of a building, but which are *manufactured* so as to be adventitiously applied. Properly speaking, the design for the decoration of any building, both externally and internally, is the province of its architect, since in this case decoration is essentially a part of architecture. If the principle insisted upon in the prefatory remarks to this Report, that ornament is the decoration of construction, be just, it will be apparent that it is hardly possible to judge of the one without the other. In works wherein the decorator makes his own sham construction in order to ornament it, as well as in those multiplied manufactured "parts" which form the staple *ornament* of a large class of *workmen* in this line, we may admire the skill of the execution, the cleverness of the details, the excellence of the manufacture, or the imitation of early works of acknowledged merit; but to appreciate "decoration" we must view it as a whole in the place for which it was specially designed, and in harmony with the building whose construction it ornaments. Moreover, it must mainly originate in local circumstances, and ought to have an individual significance. Here, however, the moment we enter upon the varied inspection we become sensible how impracticable it is to lay down any

general canon for works which differ almost as widely as the beginning and end of time. In other ages of the world, nations have been fortunate in so adapting design to prevailing wants, and in sympathy with existing feelings, as to produce a national style. But in the present day men no longer attend to such considerations; they are wholly without such guiding principles, and consequently are totally without a characteristic style. They are satisfied with the indiscriminate reproduction of the architecture of Egypt, Greece, and Rome, or of Christendom in any, or all, its marked periods. Originality they have none. One man delights in a Gothic villa; another prefers the style of Italy: even India and China have their advocates, who never consider that climate and use should rule the choice, rather than fantasy and whim, and that there *must* be conditions arising from the present state of society, from fiscal regulations, modern habits, &c., which, duly attended to, would, in addition to utility, be likely to result in novelty and beauty.

It is this merely imitative character of architecture which has so largely contributed to decorative *shams*, to the age of putty, papier maché, and gutta percha. These react upon architecture; and, from the cheapness with which such ornament can be applied and its apparent excellence, the florid and the gaudy take the place of the simple and the true. A popular writer describes the wearer of cheap finery as having his jewellery "a size larger than anybody else;" and so it is with the cheap finery of imitative ornament: it is always "a size larger" than it should be—bolder, coarser, and more impudent than the true thing; it excites our contempt by its flashy tawdriness, so incongruous with the meanness and vulgarity it is intended to adorn.

From this *manufacture of ornament* arises all that mixture of styles, and that incongruity of parts, which, perhaps, is itself "the style" of this characterless age. Through it, also, the plasterer and the paper-hanger too often usurp the place of the architect, to the certain dismissal of the mason and the wood-carver; and ornament, perchance in itself unobjectionable, is sure in such hands to be grossly misapplied.

The "designs" for architectural decorations exhibited are few in number, and are very open to the foregoing criticism.

Those on the foreign side are in the French department: they seem the very vagaries of a fantastic imagination, full of fancy, it must be owned, and skilfully executed, but without the slightest sense of utility or of constructive truth. Everywhere ornament is in excess; the architectural construction obscured and overlaid with figures, fruits, flowers, &c., so that they seem more fitted for the scene of a theatre than for any sober purpose of every-day life. Crowded together in such capricious abundance, the ornament can only be that of those cheap imitative manufactures we have above referred to. The "designs" on the English side consist of a few reproductions and adaptations of early styles, on which invention is as much wanting, as in the others it is in excess. Of the works themselves exhibited in this section, the reasons already given will dispose of a large number, since it is impossible to view them otherwise than as specimens of skilful execution, or the reverse; thus, for example, what can justly be said of the ceiling exhibited by A. MONTANARI of Milan? (Austria, No. 738.) The room which is fitted up for its reception is badly lighted, and otherwise unsuitable, and the reverse of what is requisite for a library, for which the decoration is intended; but that

matters little, since, under the best circumstances, it could be truly appreciated only in connexion with an architectural reality. It may deserve praise for its extremely dexterous and skilful execution; but this is quite a separate thing from exhibiting any just principles on which it has been designed. It may be said, however, that, as a ceiling, the decoration is too heavy, both in form and colour. This, which would be even more apparent in a lighter apartment, is a great error in a ceiling decoration, having the effect of depressing it, and diminishing the height of the room—a fault often seen in the richly gilt and massive ceilings of the continental palaces. It may, indeed, be laid down as a rule, that the decoration of a room should diminish in heaviness, in strength, and in gorgeousness as it passes into the ceiling. Then again, as to the numerous ceiling decorations beneath the galleries on the English side: from the same causes it is only possible to speak of the skill of the decorative workman, since to judge of their local adaptation is out of the question: the light and graceful decorations being necessarily placed at the same height as the heavier and more richly treated ones, and of course their due adaptation judged of equally by that height, although, perhaps, the one may have been designed for a much lower ceiling than the other. The like difficulties, arising from causes before enumerated, prevent the proper consideration of the various specimens of wall-decorations. The principles, however, which are given under the head of Paper-hangings, eminently apply to such works.

The restoration of parts of existing buildings calls for little originality in the designer, since it almost wholly consists in the careful study of the decoration which remains, aided by a knowledge of the traditional ornament of the period. Such are the carefully restored spandril for Hereford Cathedral by N. J. COTTINGHAM (No. 63, Main Avenue West), part of the tomb of Queen Philippa by S. CUNDY (No. 60, Main Avenue West), and the wood-carving for the dining-room at East Sutton Place, designed by C. J. RICHARDSON (Class XXVI., No. 207A). In such works the taste of the designer is shown in excluding the coarser characteristics of the style, and making use of those only which, if less marked, are also less extravagant, adopting its general spirit, rather than copying its individuality. Thus in the sister art, the unskilful portrait-painter seizes on the most salient characteristics of his sitter, and dwells upon all the individual defects of form and feature: the result is a likeness indeed, but a caricature even upon the homely original. The painter more skilled in his art avoids such coarse renderings, and under his hand even the plainest face is refined and generalised. In the same way a style becomes degraded. The decorators who adopt it overlook the spirit of its general idea, and exaggerate its peculiar characteristics, until at length it is likely to become a mere distorted caricature. Thus it was that the Renaissance degenerated into the Tudor, and the ornament of Louis XIV. was further degraded into the rococo and bizarre style which now goes by that name. A work, otherwise of much merit, may serve as a slight illustration of these remarks: it is the decoration, carved in walnut-wood, for the end of a room, in the style of Francis I., exhibited by Messrs. HOLLAND and SONS (Class XXVI., No. 161). This skilful work is detracted from, in a degree, by want of due selection: thus the large shell-forms, used in the blocking course above the cornice, are heavy and out of place in such a situation, and should not have been so used, however sanctioned by traditional authority. The ornament of the pilasters also, otherwise well

designed and skilfully executed, ought in wood-carving to have been kept in lower relief, so as to have been within the surface of the pilaster itself instead of projecting beyond, by which it is at once evident that the ornament is applied, and not, as it should be, carved from the solid wood.

Space will not permit, even if it were necessary, to speak of the numerous carved and other works in stone, wood, and marble, for decorative additions to buildings, exhibited in various parts of the Exhibition, since there is little which, from the original or peculiar application of design, calls for especial notice. The errors of such works will often be found to originate in the construction fitted for one material being applied to another, thus, that which ought to have been stone is wrought in wood, or wood treatments are carried out in stone or metal. The costly malachite decoration exhibited in the Russian Court may be noticed as an example of this mistake. Stone doors at all would seem to be an anomaly, but framed after the manner of wood still more so. In addition, the doors, which necessarily produce a sense of extreme weight, are hung to pilasters so narrow as to be quite disproportioned for their support.

It may not be amiss here to advert to the error arising from excess which these works illustrate. Thus, the malachite vases exhibited in this room are improperly supported on malachite pedestals, greatly detracting from the sense of rarity and richness which would result from having only the principal object made of the rare material and its support in a baser one, while all the enrichment which would arise from contrast is lost also, and the eye is fatigued with the quantity and sameness of colours, which would have been refreshed had a marble of some homogeneous colour been used for the bases instead of the malachite.

Ornaments manufactured from plaster materials, such as gutta-percha, putty, carton-pierre, &c., have no doubt a substantial value in the Great Exhibition, commercially considered. As regards design, however, they are but dangerous subsidiaries, often doing greater injury, from the tasteless, misplaced, and false decoration arising from their use, than good, by ministering to decorative purposes. Apart from that monotonous multiplication of the same forms, necessarily resulting from the unvarying productions of the mould and the die, which has been before alluded to, there are other evils sure to accompany *manufactured* decorations such as those now under consideration. The great cheapness of the substitute, compared with the real material, inevitably leads to excess. Such ornament always seems added or applied, stuck on as it were, and can rarely be made to appear as a part of construction; it therefore constantly carries with it a sense of untruth, till the mind and eye, from habit, become satisfied with it, and at the same time deadened to what is really true and good. Moreover, decoration of such materials must necessarily be patchy and incomplete: when the parts to be ornamented are large, this evil is seen in its most exaggerated form; a florid and gaudy centre has perhaps to be united with coarse corners, either by other ornaments or by the repetition of the centre portion, and all sorts of expedients must be resorted to to "bring in" the parts so as to suit the architectural distribution of the apartment; it can indeed barely be possible that the quantities, or the geometrical arrangement in which the ornament has been originally constructed, will agree with the place to which it has to be adapted, and more or less of make-shift must be the result. One of the most

important works in such materials is the centre compartment of a room in carton-pierre, by V. CRUCHET, which, with all the excellences of the manufacture, exhibits many of its prominent defects, and may serve to illustrate the general faults of such materials. Thus it is decidedly over ornamented, and this is shown not only in the excess of ornament, but in the want of relative scale between the ornament and the constructive forms of the architecture, the former being far too large, as well as too redundant. Scale also seems to have been quite disregarded in the parts themselves, since the fruit and flowers, the birds and game, of one part, are different in size from those of another part. The style, again, is mixed, one part being two centuries earlier than the other. There is, besides, far more pains taken with the exact rendering of fur or a feather, than in perfecting the form of a moulding, or the shape of a panel—the architecture has, in the designer's mind, been subordinate to the ornament, and an ill-formed ellipse, or a coarse and unrefined moulding, appears of less importance to him than the mere imitation of the feathers of his birds, or the fur of the animals of which his ornament consists. Carry this treatment a little further, and it will result in having the game, the fruit, the foliage, and the flowers not only modelled to the exactest imitation, but the skill of the painter called in to add to its naturalism, and the whole painted with the colours of nature; thus decoration will be thought perfect only when it competes with those strange relieved pictures which are exhibited in frames in close juxtaposition with the work in question. Of the artistic and skilful grouping, and of the merit of the modelling of the ornamental portions of this decoration of Cruchet's, there can be no question; but, as has been before said, even these excellences may merge into faults if they are too exclusively directed to mere imitation, and if the design to which they are applied has not the merit of a just perception of use and purpose. One great cause of evil in the use of the materials under consideration consists in the false principle of their application to decorative purposes. It is found, for instance, that peculiar qualities, which are difficult of attainment and an effort of great skill in other materials, can easily be obtained by a new means; instead, therefore, of carefully studying its just adaptation to ornamental production, the effort is only to emulate in excess those peculiar qualities which are trials in the more intractable material. It too often happens, moreover, that the original works imitated were in false taste; and this becomes far more apparent in the copies, since the mind can no longer dwell on them with that admiration which is caused by a sense of difficulties overcome, and which compensated, in some degree, for the absence of good taste in the works they emulate: for instance, the exact imitation in wood or stone carving of the individual details rather than of the general character of objects used as ornament, extreme relief, under-cutting, lightness, thinness, and picturesqueness of the forms of foliage and flowers, whereby their natural growth is attempted in carving rather than a due ornamental disposition of their forms—all tending to excess and exaggeration, and to be avoided rather than copied. Another source of error consists in rendering what should be true constructive forms into mere ornament; thus pilasters, and even columns, consoles and trusses intended to support weight, are manufactured in these imitative materials, and introduced only to decorate, until all sense of utility and construction is lost, and ornament becomes the principal instead of the subordinate. Such materials,

however, are capable, under proper control, of useful application to ornamental purposes, both from their ready adaptability to various surfaces and forms, and from the cleanness and sharpness with which they can be moulded, as is seen in the works of the GUTTA PERCHA COMPANY, those of JACKSON and SON, of BIELEFIELD and Co., and of others, as well as in the work above referred to. It is most desirable, therefore, that the errors to which a false application leads should be carefully pointed out, so as to bring these materials as much as possible within their duly limited use.

Some of the above criticisms will apply to terra cotta also; but this material, partaking largely of reality and allowing of being perfected by the hand after the first mechanical process of moulding, would, under fitting regulation, become a most useful and durable agent of ornamental decoration.

STAINED GLASS DECORATION.

The art of painting on glass, or glass-staining, has come down to us so intimately mixed up with the ecclesiastical architecture of the middle ages, that it is almost impossible to view the one unconnected with the other. It was born of the same parent (the Church), and from the first both were equally devoted to her service. Of Gothic architecture, and of it almost exclusively, stained glass has always formed a necessary decoration: it follows, therefore, that its ornamentation is almost wholly traditional, and has relation to the various periods of the Gothic architecture which it accompanies.

Not that it is necessary, or even desirable, that the epochs of the two arts should, in their revival, continue to correspond; but the periods of each, whether simultaneous or otherwise, when utility and beauty were most fully understood and attained, should be diligently studied in search of the principles that guided the artists of those times, and that which is best should be chosen, irrespective of mere correspondence of epoch or antiquarian authority. Moreover the errors, which the ignorance of an early age evidently occasioned, should be carefully separated from the truths, and not considered as of necessity a part of the *style* of the period in which they are found,—such, more particularly, as bad drawing and want of knowledge of the human figure; at the same time, that simplicity of treatment which is so highly characteristic of early works, which overlooks all details, and renders a composition from the Scriptures, or a single figure, more as a symbol than as a picture, should, if it is found to be a principle of excellence, be carefully retained.

As is the case with all other manufactures and fabrics, so it is with painted glass: the question of utility, rightly considered, will lead us to some knowledge of what is most suitable in its treatment as a decoration. Glass was introduced into the numerous windows of Gothic architecture to temper the glare of light, and to serve in a manner as a blind by preventing the direct entrance of the sun's rays, and also to shed that solemn religious light which so well accords with the sacred mysteries of religious worship. The mosaic glass of the early artists of the 12th and 13th centuries was most admirably adapted for this purpose: being composed of many small pieces of full and pure tints, with little white glass, the rays of the sun were broken and dispersed, the light lowered in brilliancy, and the whole effect was homogeneous, rich, and solemn, sufficient light being still permitted to enter for the performance of the religious services of the church. Even compositions of

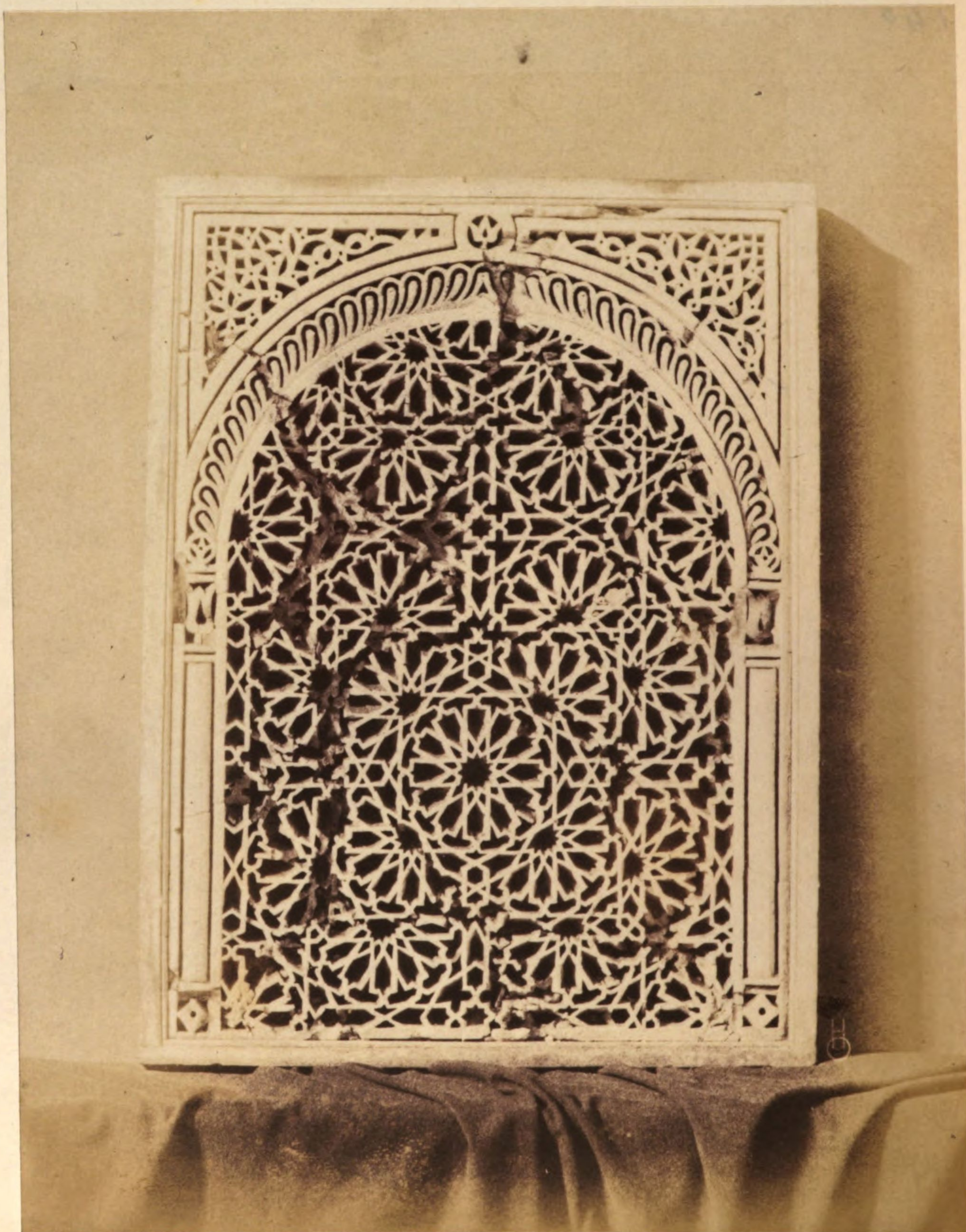
figures were subject to the principle that regulated the whole: the figures were small, so that the colour of their draperies and accessories might be broken up into many pieces to give the same equal distribution as in the ornamental parts of the window. It would seem, indeed, that the painter did not intend to simulate a picture, but rather to symbolize a sacred text or thought, and the figures, therefore, were not so much pictorially arranged, as composed with extreme monumental simplicity; thus, they not only partook of the general effect of the window, but the attention of the spectator, impressed with the solemn yet beautiful light, was, at the same time, filled with the holy thought conveyed by the subject, without being distracted by too great an individuality of parts. The representation of shadow, strictly speaking, was not admissible, the composition consisting only of flat forms of the greatest simplicity. For this, even, there would seem to be just reasons: the light being transmitted through the glass to the spectator within, shadow would appear to be anomalous and out of place, since the illumination in such a case emanates from the figures themselves; moreover the simplicity of the shadowless forms was better suited to impress the eye from the distance at which such works must necessarily be viewed. Such would seem to be some of the principles which ought to regulate, and which in the best times did regulate, the design for painted glass. An entirely different view of the art has however sprung up with its revival, and has obtained many advocates, especially on the Continent. It has been felt how greatly art has advanced in the hands of the historical painter since the times spoken of: that the principles of composition, of foreshortening, of perspective, of light and dark, and of the arrangement of colour, then quite unknown, have been discovered and developed; that drawing, then in its infancy and unaided by knowledge, has now arrived at maturity; and that science has given us power over the materials which they possessed not, and enabled us to conquer difficulties which they considered insuperable; and it is asked why the painter on glass should not avail himself of all these advantages, to perfect his art and render it as pictorial as the works of his brethren. By artists who entertain these views, the surface of the window is treated almost as a canvas would be: the forms of the figures are large, even as the size of life: the draperies are massive, and the heads painted with great imitative skill and completeness. Clair-obscur and perspective are studied, and foreshortening and pictorial attitudes in the figures supply the place of the monumental and statuesque delineations of the earlier artists; in fact everything is done to treat the window as a picture.

To the advocates of this style it may be objected, that a picture is specially intended to address itself to the mind and imagination only, while painted glass has a reference to use also; and that, apart from this consideration, each and every art has its own mode of rendering nature—not necessarily implying *deceptive* or complete imitation; thus, for instance, the art of the sculptor is a generalized imitation of form, and even the painter of high art does not desire to make his picture deceptively imitative, but listens with impatience to the remarks of the ignorant, who are apt to praise his work for this quality above others proper to it which they do not understand. An outline of Flaxman's fills the mind with a perfect sense of beauty and with the fulness of a poetical idea; surely, then, the flat and simple treatment of subjects in glass-painting, if such treatment is requisite for its utility and most in consonance with its other

qualities, may be found sufficient to give as complete an expression to the pictorial rendering of a scripture truth as the material and situation of such works require.

Among the works in the Great Exhibition, both manners are adequately represented. Thus the pictorial method is well illustrated in the ably executed window of MARECHAL and GUYNON (No. 329, France), of "St. Charles administering the Communion to the Plague-stricken." Here the forms are simple and broad, the masses of colour large, and the effect thoroughly that of a transparent picture, with all its details well drawn, carefully painted, and rounded by shadow; while the composition is arranged with regard to the laws of *clair-obscur*. But instead of that general and harmonious effect of sobered light, which is so desirable in stained glass for the windows of a religious edifice, the effect is painful to the eye from its extreme brightness, and the window would irresistibly obtrude itself upon the attention of the spectator, and rather distract his thoughts than induce that solemn repose of mind which is so consistent with the place. The great Dante Window, by G. BERTINI, of Milan (Main Avenue, West), is another example of this method. It is a very skilful work so far as regards the manipulative means, well drawn and painted, and exhausting the resources of the material. As a window, however, it is exceedingly sombre, and would far too much reduce the light in any building to which it might be applied. The colouring is cool and pleasant, in which respect it is better than Marechal's window, which is too hot. It is to be observed also that the construction of the window is greatly in the way in these pictorial treatments, and that a false construction has been adopted in both these works, in the latter, indeed, without the slightest architectural fitness. The other method of treatment has also many representatives, some of much merit. Among these the "History of Sampson," by A. GERENTE, a work of great purity as to traditional style, although in adopting the just principles of design the faults of the age have been adopted also, which must be objected to. The texture of colour in the glass, if such a term may be used, has been obtained with great skill by this artist. LUSSON'S window, competitive for the St. Chapelle, is also a good example of this manner—dust and time, and the corrosion of the glass, have, however, been too much imitated, necessarily perhaps in a restoration, but rather interfering with this otherwise meritorious work. HOLLAND, of Warwick, "Life of Christ" (No. 407, Class XXVI.), I. A. GIBBS (North-east Gallery, Class XXIV.), J. G. HOWE (Class XXVI.), and Messrs. CHANCE & Co., have specimens of glass of this style of various merit.

It would seem to be a great fault in glass to have a prevailing tint or hue, since by a truly harmonious composition of colour such a result would be avoided. This defect is visible in the glass exhibited in the North-east Gallery, in some of which a prevailing green, in others a yellow hue, is observable. This is often the case also with the modern French glass, as seen in some of the restored churches of Paris, more especially the pictorial glass, in which a hot red hue is often present, sometimes to a painful extent: the flesh especially is hot, and dirty in the shadows. It is to be doubted, indeed, if, with all our knowledge of the harmony and complements of colours, we have yet attained to the principles by which the old glass-painters arranged their agreeable combinations. Whatever was the method, the effect was coolness of general tone: the flesh had little local colour, the prevailing tints of the draperies and accessories were blue, cool green, and amethyst, and even the red was cool, inclining to crimson. The hot browns of



WINDOW.
(PLASTER)

TUNIS.

the flesh in the modern glass, together with its opacity, are often very disagreeable, and the effect of scarlet instead of crimson may be seen in the work of MARECHAL, before spoken of, where the robe of the cardinal who is administering the sacrament (a large mass) is of that hue, and greatly tends to increase the hot and glaring effect of the whole. In the Parisian churches, where ancient and modern glass are both to be found, even when the former is not of the best period, as in St. Germain l'Auxerrois, for instance, it is quite refreshing to turn the eye from the modern to the old glass, showing how far more harmonious the one is than the other.

In estimating the excellences of the one or the other methods of glass-painting which have been spoken of, the superior durability of the earlier method is to be noticed; also the much smaller liability to accidents from the diminished size of the pane, and the much less damage if a fracture do take place: an unlucky blow may immediately destroy the finest portion of a pictorial window, while it could do but small injury to a work on the older principle. These are minor merits, but to them may be added the greatly increased brilliancy of colour occasioned by the more frequent interposition of the dark line of the *leading*, and the lustre occasioned by the slight change of plane, in the smaller pieces of the early method bringing out thereby the richness of the glass, as the varied facettes of the lapidary do of the precious stone. Indeed it may be doubted if the subject of *leading* has had all the attention it so well deserves. The skilful manner in which this was executed in the early works is apparent from the preservation of the windows, unharmed by the storms and winds of centuries. It is certain that a varied surface was at times adopted in such works, for resisting, as has been supposed, the pressure of the winds: thus at Haddon Hall, in the long gallery, glazed in the reign of Elizabeth, each window is waved inwards and outwards over the whole surface, and each piece of glass cut to adapt it to this treatment: the result has been great durability, even although the lead itself is extremely narrow. These are, it is true, windows of uncoloured glass; but it may probably point to some such method being used in decorated windows, to enhance their brilliancy and increase their effect.

INLAID FLOORS, MOSAIC PAVEMENTS, INLAID TILES, &c.

The ornament of this section seems the soundest and most satisfactory in the Exhibition—the most free from false principles, the most thoroughly amenable to true. Although this no doubt partly arises from the conditions of the manufacture, it is, in a degree, to be attributed to other causes. The modern introduction of such works in England was at a fortunate time, when the attention of the ecclesiologists and of able artists was called to the revival of mediæval art, and to the study of the best works of Greece and Italy. The designer, therefore, started upon just principles, and continues to adhere to them, even repudiating some of what must be considered errors in the ancient works which have been handed down to us, such as those arrangements of light and dark inlays, giving the appearance of relief, which are found occasionally even in the best ancient examples. The “designs” exhibited are almost wholly on the English side. Apart from those in conjunction with manufactured specimens, Mr. Digby Wyatt's are the most important: they are varied and fanciful, thoroughly flat in treatment, and consisting mostly of combinations of simple geometrical forms, although there are some of Italian con-

ventionalised ornament. They evidence the careful examination and study which the artist has given to the best antique and mediæval treatments of mosaic. Mr. MINTON, of Stoke-upon-Trent, makes the most important exhibition of such works from designs of Pugin, Gruner, Wyatt, &c., together with some copies of fine mediæval examples and ancient works of great merit.

The illustration No. 1 is of an enamelled wall-tile, imitated from one found at Salisbury, and is given here to show the mode in which flowers were used as ornament in such works by the mediæval artists. The flower is displayed perfectly flat, in one colour, and arranged geometrically.

No. 1.



No. 2 is given as a more intricate treatment on the same sound principles, and is from a design by Mr. Pugin.

No. 2.



No. 3 is an intaglio and enamelled tile of a Moorish pattern, for covering the surface of a wall with an ornamental *texture*, and with a broken harmonious richness of colour, in very durable materials, for which purpose it is admirably adapted. This manufacturer exhibits also many novel and praiseworthy works in burnt and coloured clay to facilitate the application of design and colour to the exterior of buildings. Among others, a species of Majolica ware, with ornament in relief, coloured

with delicate tints, intended to be introduced into friezes, string-courses, panels, &c., and other combinations of the art of the designer with the skill of the tile-maker and the potter, which will enable the architect to break the monotonous surface of brick buildings, and introduce ornamental forms and colour without the necessity of resorting to plaster and stucco, so long the wretched resource for such purposes.

No. 3.



From the geological position of London, bricks must always be the prevailing material for building purposes: such means, therefore, for the safe introduction of colour and ornament, are especially desirable, and should be carefully studied, that the most judicious and sound principles of ornamentation may be adopted in these newly-revived materials. It is curious to see how instantly the removal of the excise-duty on bricks has been followed by the infusion of a new life into the manufacture, both as to novel forms and the application of coloured ornament to their surface; it must be remarked, however, that the ornament of each separate brick should be perfect in itself as well as perfect in combinations, a circumstance which has not been attended to in the glazed and coloured bricks exhibited by Mr. Minton.

From the general use of carpets, considered, as they are, as a necessary comfort in this country, inlaid floors are far less used here than on the Continent, and it is on the foreign side, therefore, that the best design applied to such works must be sought. The principle of ornamentation, of course, is the same as that for mosaics and other inlays; care, however, should be taken to select wood without a strongly marked form in its grain, since this is likely to interfere with the pattern of the inlay in general; also right-lined figures are preferable to curved ones, from there being less need of crossing the grain of the wood in cutting.

Many skilful and ingenious combinations of geometrical forms are seen in the works of this kind in Belgium, Austria, Russia, and France; among others, the flooring of the bed-chamber in the Austrian room, of which the border, consisting of violet ebony and mahogany banded with maple-wood, is simple and pleasing in effect; and a floor by DE KEYN and Co. (No. 434, Belgium), which has much merit in its design: nor should mention be omitted of the very clever inlays for floors and furniture of MARCELIN (No. 606, France), some of which are of the most intricate geometrical character, excellently executed, for borders, panels, frets, &c. Being limited by true principles, these manufactures show less that is meretricious than do most other sections of the Exhibition, and far less tendency to that over ornamentation which elsewhere predominates.

PAPER AND OTHER HANGINGS.

If the use of such materials is borne in mind, the proper decoration for them will at once be evident, since this ought to bear the same relation to the objects in the room that a background does to a picture. In art, a background, if well designed, has its own distinctive features, yet these are to be so far suppressed and subdued as not to invite especial attention, while as a whole it ought to be entirely subservient to supporting and enhancing the principal figures—the subject of the picture. The decoration of a wall, if designed on good principles, has a like office: it is a background to the furniture, the objects of art, and the occupants of the apartment. It may enrich the general effect, and add to magnificence, or be made to lighten or deepen the character of the chamber: it may appear to temper the heat of summer, or to give a sense of warmth and comfort to the winter: it may have the effect of increasing the size of a saloon, or of closing-in the walls of a library or study: all which, by a due adaptation of colour, can be easily accomplished. But, like the background to which it has been compared, although its ornament may have a distinctive character for any of these purposes, it must be subdued, and uncontrasted in light and shade; strictly speaking, it should be flat and conventionalized, and lines or forms harsh or cutting on the ground as far as possible avoided, except where necessary to give expression to the ornamentation. Imitative treatments are objectionable on principle, both as intruding on the sense of flatness, and as being too *attractive* in their details and colour to be sufficiently retiring and unobtrusive. Some of the best examples, as well of paper as of silk, velvet, and other hangings, are treatments of *texture* in a self-colour; as of flock on plain or satined ground in paper, of tabby and satin in silk hangings, of stamped forms or cutting in velvet, or the same contrast of pattern with the ground in various mixed stuffs. By these means the ornament is necessarily flat, and does not disturb the general effect. With the slightest attention to the choice of form it can hardly be in bad taste, whilst great elegance and beauty often arise from such treatments. Next to these, graduated tints of the same colour produce a safe and quiet ornamentation for such fabrics; or gold upon a coloured ground, where the gold is sparingly distributed and the colour not too strongly contrasted, since in all cases a general *tone* of surface is to be sought for rather than pronounced individual forms. Further richness may be obtained by the judicious use of two or more colours, either, according to the ancient method of harmony, separated from each other by bands of black, white, or gold, or contrasted and enhanced by their complementaries, and enriched by flock in either case, in the latter by gold. But it is everywhere apparent that the combination of many colours, though it may increase expense from the number of blocks, is far from producing richness in the same degree, while it has often quite the contrary effect, and results only in poverty and meanness. It is necessary, however, to advert to a perfectly different treatment of these materials quite at variance with these rules, and bound by no such principles, by which paper-hanging becomes a pseudo-decoration, the wall being divided into compartments often irrespective of architectural construction, and pilasters, friezes, and mouldings imitated in false relief on its surface, with compositions of pictures, statues, hangings, flowers, fruits, &c., skilfully designed and well drawn, and, it may be, often most ably blocked for the purpose of printing; it is, however, at best but a sham decoration, amenable to no laws, necessarily false in light and shade, often constructively inap-

plicable, and always impertinent and obtrusive, and should be left to those who, desiring display, are too much wanting in taste to be annoyed at its untruth and extravagance. It perhaps is not quite out of place in the saloon of a theatre, in cafés, or taverns, but ought to be confined to such localities, and only used there until the general taste is so far instructed that the public will no longer tolerate gaudy shams and false magnificence.

The same laws which ought to govern design for paper-hangings would, therefore, appear proper to regulate hangings of other fabrics, tapestries, &c. Although far from looking at ornament in that exclusive spirit which would reject what is beautiful when it does not square with the requisitions of a theory, it must be obvious that pictorial and picturesque treatments for such fabrics are wrong whenever they intrude on the domain of another art. Thus, figures, landscapes, fruits, and flowers, when rendered as they would be in works of fine art, are almost of necessity inferior to the pictures they imitate, even when they are as skilfully and wonderfully wrought as in the works exhibited by the national establishment of the Gobelins, where every effort of skill and science has been most successfully used for their manufacture and embellishment. Indeed, it is a matter of doubt whether custom, and the authority of great names and of past times, are not the causes of the continued admiration of such decorations, which perhaps we rather persuade ourselves we like than are fully satisfied with.

With very few exceptions, the exhibited "designs" for hangings appear to be totally unregulated by any perception of rules for their ornamentation, and, even when they happen to be on just principles, would seem to be so by chance rather than by choice. They are mostly florid and gaudy compositions, consisting of architectural ornament in relief, with imitative flowers and foliage. In some of the cleverest designs the flowers and foliage are perspectively rendered with the full force of their natural colours, and light and shade; moreover, they are often three or four times as large as nature, whereby the size of a room would be apparently diminished. The French are the largest contributors, and their designs are characterised by the foregoing remarks; they are, however, exceedingly skilful in their details, the flowers and foliage well understood and artistically arranged, and *blocked* with great skill and knowledge; but as to style they are most objectionable, and lead to the worst results, especially in the common manufacture of such goods.

The pupils of the Government schools exhibit, among other designs, some meritorious ones for paper-hanging. It is evident that their general taste is controlled and regulated by the knowledge of the just principles which should govern the ornamentation of these as well as of the other manufactures for which they have laboured. Being students' works they can hardly be expected to abound in fancy or invention, and it is sufficient to find that they are well drawn, skilfully executed, and amenable to just laws of composition. In examining the design applied to the manufactures themselves, the same want of just principles is observable as in the works of the designers. It is true that manufacturers must produce works in every style, as well to suit those who are unable to appreciate what is good, as those of more informed taste; but it might be expected in an Exhibition of this nature—an Exhibition of skilled labour and of the strife after excellence—that excellence would be the rule, and error the exception, whereas the reverse is generally the case. Were it a part of the duty of the Reporter to enter into the clever

and skilful execution, the treatment of the pigments, the excellent blocking, or the general manufacture of such fabrics, there would be much to say of the foreign exhibitors, DELICOURT (No. 1715, France) and ZUBER (No. 1536, France), SPOERLIN and ZIMMERMANN (No. 651, Austria) of Vienna, and others, as well as of TOWNSEND and PARKER, WOLLAMS, and others on the English side; but in the *design* of their papers there is little to commend, and works of passable excellence in this respect are the rare exceptions to their collections. One or two designs, delicate in colour and on just principles, are exhibited by FETTER and RAHN (No. 262) in the Russian Court, mixed up, however, with others in the usual false taste; and passable designs on the principles herein advocated are to be found occasionally in other collections, evidently resulting from a happy accident rather than a well-regulated choice. The English and foreign manufacturers seem equally at sea: with the exception of a few simple diapers, which hardly call for individual remark, the works of the best Exhibitors on the English side, while they are very heterogeneous, are less original and equally wanting in a sound knowledge of what is properly characteristic for such works.

There are, however, honourable exceptions to these remarks: after passing in review the paper-hangings of the various countries, it is quite refreshing to meet the clever wax-cloth decorations exhibited by M. E. T. VIVET (France, No. 734). The ornament of these works is without shadow or imitated relief, thoroughly flat in its forms, which consist of graceful and flowing lines; the colour is equal in scale, without harsh contrasts, and of semi-neutral hues. There is no attempt at shams, to imitate marble, or oak, or any carving; nor to panel it, which is left to arise out of the architectural forms; but a series of graceful lines, with a quiet uniformity of tint, satisfy the mind and give repose to the eye. Moreover, having laid down certain principles on which manufactures and fabrics should be designed with a view to the true use of materials, and to avoid unnecessary display, by the proper application of ornament, it is impossible to refrain from speaking in high terms of the works contained in the Mediæval Court, manufactured by Messrs. MYERS, MINTON, CRACE, and HARDMAN (Class XXVI., No. 529), under the direction and from the designs of Mr. W. Pugin. Some may object to the exclusiveness of the style, and to its too purely ecclesiastical and traditional character, even in domestic works; but for just principles of decoration, for beautiful details, for correct use of materials, and for excellent workmanship, the general collection is unique. Thus, in the paper-hangings, for instance, there is no throwing away of many blocks to obtain richness, when one or two can be made sufficient: there is a perfect flatness and a subdued harmony of colour in all such works; and if Tudor roses and heraldic lions are sometimes too pronounced, and there is occasionally a little excess of ornament, richness is generally obtained at the smallest sacrifice of means, and without any sacrifice of truth. The same may be said of the hangings in silk and wool, and the carpets in this collection, the designs for which are highly commendable for their strict adherence to true principles.

Without having any sympathy with the *application* of decorative paper-hangings, such as those of Delicourt and others, it would be unjust to pass them without praising the artist-like design, the powerful execution, and the great ability displayed in these works by the French artists. In that by DELICOURT, besides the skilfully-blocked hunting subject of the centre panel, the details of the

parts, such as the grouping of the game and arms on the pilasters, and of the birds and children on the frieze, have great merit, apart from the skill with which the whole has been adapted for block-printing. The same may be said of the work exhibited by MADER BROTHERS, which is an extremely fanciful and clever piece of decoration, and in as good taste as such false treatments can well be. The frieze of children is well designed and ably managed for printing; the landscape of ZURBAN has also much merit in its details; and the work of GENOUX has parts worthy of examination.

These decorations bear out the remarks at the opening of this Report as to the superiority of the French working artists. The men who carry out the designer's inventions in France, must themselves have a large share of skill and art-knowledge to be able to prepare the design for the manufacturer's processes with the ability so evident in the works just remarked upon.

Among the English contributions in paper-hanging are specimens of the lately-introduced processes of printing by such machinery as is used for cotton goods, and of applying many colours from one block. These are likely to create a style of ornamentation for such fabrics of the most depraved kind. The largeness and flatness of details attainable by block-printing are less suited to cylinder printing than more minute details, and the new processes offer ready means of applying several colours at a small expense; the reverse of what has hitherto been the case; hence the effort has been to impress as many tints as possible on paper, and excellence is reckoned rather by the number of colours than any other quality. Thus we are informed that works are printed in "sixteen colours," in "fourteen colours," &c., the works themselves evidencing the absence of all knowledge of the effective arrangement of colour; while violent, crude, and harsh tints are too often used to give greater impression of this *excellence*! and the result is littleness and extreme meanness; in fact, such papers are, in point of design, much inferior to those printed in two colours by the same machinery. Well-considered design, thoroughly adapted for this process, would enable the manufacturer to unite good taste with extreme cheapness; whereas the only present result is by increased labour to detract from the beauty of the ornamentation. It is impossible, however, not to remark the skilful printing exhibited by our English manufacturers.

EXTERIOR AND OTHER METAL WORK.

The works, in metal, of this section which are exhibited, consist chiefly of constructions for fountains, and of ornamental iron-work in gates and balconies, and for door-panels, lamp-pillars, flower-vases, and tazzas. The best of the metal fountains are so nearly within the limits of fine art, that their consideration may be left to that class. It is, however, to be remarked that the zinc castings of the French and German founders show how suitable that metal is, as a means of spreading the best art, for any exterior purpose, in a cheap and durable material, as well as of embellishing public works of the above-named character, at comparatively small cost, without the evils arising from oxidation when iron is used. Notwithstanding all that has been said about the incongruity of our climate with public fountains, there are undoubtedly long periods of the year, and those when London is most crowded as well with her own resident population as with visitors, when such works are not only extremely ornamental, but

when an exhausting atmosphere would render them of real utility and refreshment. The motion of water, at any season, has a great charm, and is peculiar in its power of giving pleasure even in the simplest jet or fall, agreeably and artistically disposed; and ornamental arrangements for its full display would not only be picturesque additions to our city, which offers so many localities for their adoption, but would afford to our artists motives for combinations of figures with ornamental decoration, and thus, perhaps, be a means of once more uniting fine and ornamental art, which, sadly to the deterioration of public taste, have for so long a time been almost wholly separated. It may be doubted if the public would willingly part with even the tame and commonplace repetitions which adorn Trafalgar Square; and those who have had the pleasure of enjoying the fountains of Italy and France will be quite prepared to judge of the effect which more skilfully-designed structures would have on the public mind here.

Such works in iron as gates, balconies, and panels, are, for the greater part, in cast metal, which of late years, from its capability of cheap ornamentation, has almost wholly superseded wrought iron for these purposes. Where the object is intended to be fixed and immovable, as a balcony or panel, cast work is not unsuitable, and is capable of much beauty of ornamental design, as we see in panels exhibited by MUEHL, WAHL, and Co. (France, 934). In these the ornament adds to the strength by its numerous articulations, while it is light and elegant in its forms. Works of this kind are generally of a size to admit of casting in one piece, ensuring thereby strength and lightness by continuity of parts. But in cast-iron constructions intended to be moveable, as in the various kinds of gates, a very different character of design is necessary; in the first place, because entire casting is not always possible, both from the difficulty of running the metal into the numerous ramifications of the ornament in works of such increased size, and from the fear of warping in the cooling, as well as the great expense of a mould, which is saved by forming the ornament of a series of parts. This leads to the necessity of framing the work in wrought, and applying the ornamental details in cast iron; but hence results this evil, that the ornament has little constructive use, and is apt to look rather an addition than an integral part of the work. In the park-gates exhibited at the south end of the Transept, great pains have been taken to get over this difficulty, but not with success, since the two metals are joined in parts wholly at variance with constructive strength; in fact, it is a wrought-iron design, partly executed in cast metal. Moreover, cast-iron ornament is necessarily far heavier than that of wrought iron, from the extreme brittleness of the cast metal: this heaviness is sadly opposed to its real constructive strength in the manner usually adopted for putting together. The ornamental parts of such structures being riveted or screwed into the framing, there are smaller points of attachment than in wrought iron; the parts bed themselves less perfectly at the junction, since it is impossible to assist this union with the hammer, and the metal has small tenacity, and easily breaks with any sudden jar: thus there is much less power to support, while there is of necessity much greater weight to bear; and without very careful and well-considered design, making the ornament as far as possible a brace to the work, the whole is apt to be an insecure aggregation of parts, without constructive unity or truth. In large works, cast in one piece, such difficulties are readily surmounted, as weight can then be made to add strength, instead of detracting

from it. In the old hammer-wrought gates, the ornament was not only a truly integral part of the work, but most materially assisted in the general support. Thus great lightness and elegance were, in this case, consistent with great strength, since the ornamental details supplied a means, not only of tying and bracing the work together, but of preventing the front of the gate from drooping with its own weight, to the great hindrance of its use, and which in cast works of this kind has often to be assisted by the use of friction-rollers—a make-shift that the older workmen would have despised. When, therefore, we consider the varied beauty of which wrought iron is capable, its far greater durability, its tenacity and power of resisting accidents, the individuality of design which arises from its being wrought by the hand instead of cast in a mould (thereby leaving the fancy and the feeling of the workman untrammelled), it seems not too much to say that it is to be hoped the use of the wrought metal will again prevail over that of cast for such purposes.

The gates and pilasters exhibited by the COALBROOKDALE COMPANY, at the north end of the Transept, from designs by Charles Crookes, are an excellent specimen of casting, being wholly of cast iron, each gate in one piece. Much of the false construction alluded to has consequently been avoided, and many of the difficulties overcome. The design of the gates, however, partakes too much of that adopted in wrought constructions, especially in carrying up the form of the centre, at the top, into florid ornamentation, which tends in this weightier metal to sway down the gate, without any compensating beauty or usefulness. The introduction of a heavy panel of ornament below is also rather commonplace, and due regard seems hardly to have been had to the *whole* surface in designing the ornamentation. The pilasters have more originality: the small twisted bars surrounding the centre columns give a lightness, compared with the strength obtained, which adds to the elegance: the striking-plates of the hand-gates, however, should have been ornamentally constructed or banded in with the pilasters in the centre, to increase the strength and resist the jar of the closing. The other great work in metal by this Company is an ornamental dome of cast iron (Main Avenue West, No. 83). This is a work of much pretension, designed in the natural style, the pilasters representing oak-stems, ornamented with leaves and acorns, and with the intervening branches twisted into an ornamental form: this treatment is mixed with some conventional ornament, here and there, as it were, indiscriminately introduced into the pilasters, having a very patchy effect. The pilasters, also, arising as they do from a single stem, and widening above their base, have an unsteady and insecure appearance, which might easily have been avoided. The great fault, however, is in the setting on of the dome, which from the outside seems to have no constructive connexion with the pilasters, since in it the rusticated treatment is abandoned, and it seems dropped in among the branches, without any proper support. The work, nevertheless, has a certain impressiveness from its size, and its general proportions are well chosen.

There are in various parts of the Exhibition, garden-seats and chairs in cast metal, which are principally to be noticed from the great want of due consideration of the material evidenced in their design: thus sometimes they are ornamentally constructed of branches and foliage naturally imitated, or of branches alone; while, in others, carved and flowing lines are given to the back,

arms, and legs of the seat, which add nothing to the comfort of their use, and sadly detract from the form properly belonging to such works in cast metal, which should be right-lined, and have a geometric character both of ornamentation and construction. It must be confessed, indeed, that the tendency to consider the ornament before either the requirement of the material, or the use to which the work is to be applied, is but too evident in many of the works in metal in this class. Thus, two large lamp-pillars, designed by an architect, and exhibited in the Austrian department, have as much iron in their overcharged bases as would found three pillars, each capable of sustaining the taper upper shaft of the same design. The application of metal to the construction of the building is, on the other hand, an excellent example of just use, construction having had the first consideration, and ornament being entirely subservient; a due amount of elegance has nevertheless resulted from its simplicity and from the true principles on which it has been designed.

Div. 2.—*Domestic and other Furniture.*

A very large and important section of the Exhibition is comprised under the head of furniture and upholstery; and such works claim especial attention in this Report both as to their general design and their ornamentation. Almost every nation contributing to the Exhibition has sent to us its share of furniture, so that here, it might fairly be supposed, we should be able to study the conveniences for living which each country possesses, and their various contrivances for ease and rest.

The English nation, more especially, having that peculiar word *comfort* in its language, might be expected to exhibit how that sense of comfort is adequately provided for; and since, as a nation, we have a reputation for what is solid and substantial, that our furniture at least, so mixed up as it necessarily is with our daily life, with our home habits and with our national mode of living, would, both as to design and ornament, be solid, substantial, sensible, and useful. Our continental neighbours, on the contrary, living as they do more abroad than the English, and being usually presumed to delight in the gay and the ornamental, would be likely to display more fanciful, showy, and decorative works in this Class. In other manufactures, plain and useful fabrics are exhibited even when they have no pretensions to *ornamental* design; it seems therefore rather unfortunate that in the furniture on both sides of the Building, but more especially on the British, the ornamental so largely prevails to the exclusion of the useful, and that tables, chairs, and beds, fitted for convenience, rest, and repose, have been made to give place to what are presumed to deserve the name of objects of art.

English furniture has, until lately, enjoyed a reputation for its excellence of make and thorough usefulness, and manufacturers were wont to rest their credit on good materials and excellent workmanship. In such furniture the doors fitted with the nicest accuracy, the drawers moved with perfect smoothness, and the wood was so well seasoned that a faulty panel or shrunken joint was out of the question: it descended as a possession from father to son, seeming the better for its very age, and, as is fancied of old pictures, gaining richness even from time. But these sensible qualities, in which we undoubtedly used to excel, have on this occasion been less regarded by our manufacturers than decoration and display, and

they have mostly selected furniture of a class allowing the largest application of ornament, as sideboards, cabinets, bookcases, and works of the like kind, on which to exercise their skill, too often neglecting their own peculiar strength to rush into competition with their foreign rivals, without the skilled art-workman to execute, or the taste to design, which they possess. Nor is the foreign department wholly free from this misdirected effort to excel, which has resulted in many instances in over-ornamentation; thus, there are chairs so decorated that rest is impossible, cabinets and bookcases which take up much room and hold little, and beds so monumental that they remind us rather of the last sleep than of a couch fitted for our nightly repose.

In endeavouring to lay down principles which may serve as general rules for the designer, it will without difficulty be conceded that, in every kind of furniture having a specific purpose, the first consideration of the designer should be *perfect adaptation to intended use*; this may appear so obvious a truism as to want no enforcement, but a walk through the Exhibition will speedily undeceive us, for there we see a multitude of objects offending against this rule: in some of these use is almost entirely overlooked, or has been evidently quite a secondary consideration, whilst in others it partially gives way either to effect or ornament. Thus in the English department a table of costly manufacture has ornament in solid relief on its upper surface, and many of the grates evidently require a glass-case, since fire and smoke would be the worst enemies to such polished marvels. Nor are these faults peculiar to England; on the foreign side may be seen a piano-forte, surrounded by bristling bullrushes, which must always be catching in the dresses of those who approach it, and with hardly a right line in any part of it; and chairs so heavy that they must be fixtures instead of moveables; while of minor incongruities, the instances are too numerous to specify. Manufacturers should also aim at obtaining the greatest amount of convenience and accommodation in the least space, in order that the furniture may be as suitable as possible to the size and uses of the apartment in which it is placed.

Another consideration to be attended to is stability of construction, *apparent* as well as *real*; the first being necessary to satisfy the eye, the last being indispensable to excellence and durability. Thus the legs of articles of furniture, designed in the style of Louis XV., are often broken in the centre across the grain of the wood, or having their base of support far within the perpendicular line of the bearing; a fault which though not actually rendering them unstable, yet offends the eye as much as if they were really insecure.

The constructive forms, moreover, should not be obscured by the ornament, but rather brought out by it; nor should all portions be equally decorated, but only such parts as friezes, pilasters, capitals, pillars, or panels; herein simplicity is the safest guide to beauty. Over-enrichment, indeed, destroys itself, and it would not be difficult to point out works of the greatest pretension and the most costly workmanship, which are completely spoilt by this fault. Cabinets entirely covered with carving, the very stiles and rails being as decorated as the panels and pilasters: metal chandeliers, with leaves and flowers in as great profusion as in nature: papier maché hidden under a surface of pearl and gold. So extremely prevalent, indeed, is this error, that it may be said to be the ruling vice of the Exhibition. It should be remembered that contrast is one of the first elements of pleasure, and

that *repose* is one of the most valued excellences of art ; thus simplicity serves as the background to ornament, as the setting to the gem, or the foil that enhances the beauty of the jewel ; and the good artist is as much shown by sparing his labour as the bad one by over-enrichment.

It results from the above rule that ornament should arise out of construction ; the work, abstractedly, should be constructed, and then decorated ; not that it is meant that the ornament should be *applied* to the object, but (as in wood for instance) carved from it ; thus the leg formed for support, the pilaster or column for bearing, may be lightened and enriched by cutting away from the block or slab, not by adding to it. In his natural state man is a true workman in this respect, and works on just principles without knowing it. The New Zealander or the South Sea Islander first *forms* his war-club or his paddle of the shape best adapted for use, and then carves the surface to ornament it. The Swiss peasant, or the shepherd of our own hills, does the same. Such also is the case in the Eastern specimens of these works in the Exhibition, as is particularly exemplified in some choicely carved sandal-wood boxes in the Indian department. Here the natural and the refined taste agree, for the best wood-carved ornament of the Renaissance is on this principle, low in relief, seldom projecting beyond the surface of the pilaster, or the framing of the panel. In this respect the French furniture as a whole is advantageously contrasted with ours, there being less of that imitative treatment, of those bulky bunches of flowers and fruits, which project in such graceless abundance from a large number of the British productions. This arises partly from their far greater knowledge, partly from their better appreciation of the laws of ornamental treatment and arrangement.

Another subject requiring attention from the designer is the judicious choice of the materials from which the works are to be manufactured. Allusion has before been made to the error of adapting one material to the ornament which had been designed for another ; but besides avoiding this fault, the material itself should be so employed as to display it to the greatest advantage, and to produce the fullest effect of which it is capable. This remark applies equally to works of stone, wood, metal, glass, or any other material.

Thus, for instance, in wood-carving care should be taken not only to have the relief so managed as to guard the work as much as possible from accidental injury, but the designer should seek to adapt the forms of the ornament to the direction of the grain when it is open or free, and the work should be framed with a view to this consideration ; moreover, ornamental carving should not be applied to wood of strongly-marked party-coloured grain, but that which is homogeneous in colour should be selected for the purpose, in order that the shape of the ornament may as little as possible be interfered with by being mixed up with the forms and colours of the grain. It is curious how much costly and skilful labour has been thrown away from inattention to such minor considerations as these. Again, in metal work a careful study of the material will suggest, among other things, the proper treatment of the surface : this is a matter of the greatest importance to the general effect. A due distribution of burnish and mat, of gilding and plain, or of the various kinds of surface tooling, or frosted work, is of the utmost consequence—not to save labour, though this may result from it—but to give richness without gaudiness, and to enhance the beauty of certain parts by contrast with

others. When the whole surface is burnished indiscriminately, as is frequently seen, the result is a glitter which obliterates form; when the whole surface is mat, the peculiar quality of metal seems lost from the want of burnish.

In some of the furniture exhibited, otherwise of much merit, the ornament is merely conventional, and derived from known examples; while in others, it has been so designed as to have a significance and motive in its adaptation. To such we should naturally allow the higher merit, but conceits and puerilities are so numerous in works of this class, as almost to destroy the pleasure which arises from ornament specially designed. We shall, however, have the gratification of referring to some well-considered works of this kind which are evidently the results of an imaginative and thoughtful mind.

There are not many "designs" for furniture in the Great Exhibition, besides those which are shown by persons exhibiting also manufactured works of a similar kind. In such cases it has been thought most desirable to judge of the manufactured product rather than of the designs; even LIENARD on the French side, and C. J. RICHARDSON on the English, the two largest exhibitors, may thus be judged of, since they both exhibit completed works.

These general remarks will serve to introduce the first subdivision of the section—

CABINET-WORK AND FURNITURE OF ALL KINDS.

The furniture of a man's house had need to be well designed, well constructed, and judiciously ornamented, for, from being constantly under his hand and eye, defects overlooked at first, or disregarded for some showy excellence, grow into great grievances, when, having become an offence, the annoyance daily increases. Here at least utility should be the first object, and, as simplicity rarely offends, that ornament which is the most simple in style will be likely to give the most lasting satisfaction. Yet, on looking over the various articles of cabinet furniture exhibited, how seldom has this consideration been attended to! The ornament of such works on the English side consists largely of *imitative* carving; bunches of fruit, flowers, game, and utensils of various kinds in swags and festoons of the most massive size and the boldest impost, attached indiscriminately and without meaning to bedsteads, sideboards, bookcases, pier-glasses, &c., rarely carved from the members of the work itself, but merely applied as so much putty-work or papier-mâché might be. The laws of ornament are as completely set at defiance as those of use and convenience. Many of these works, instead of being useful, would require a rail to keep off the household. A sideboard, for instance, with garlands of imitative flowers projecting so far from the slab as to require a "long arm" to reach across it, and ever liable to be chipped and broken; and cabinets and bookcases so bristling with walnut-wood flowers and oak-wood leaves, as to put use out of the question. Now, besides that such treatments are not ornamental, they are not beautiful, and only enter into competition with stamped leather and gutta-percha. There is great reason to doubt if this merely imitative carving is ever just in principle, when applied ornamentally to furniture; for, although the masterly chisel of Grinling Gibbons has raised it to great favour in this country, and although it may be tolerated when executed as skilfully as is that on a pier-glass frame by W. G. ROGERS (Cl. XXVI., No. 195), yet it becomes absolutely unbearable under less skilful hands, and when it is lavished in such

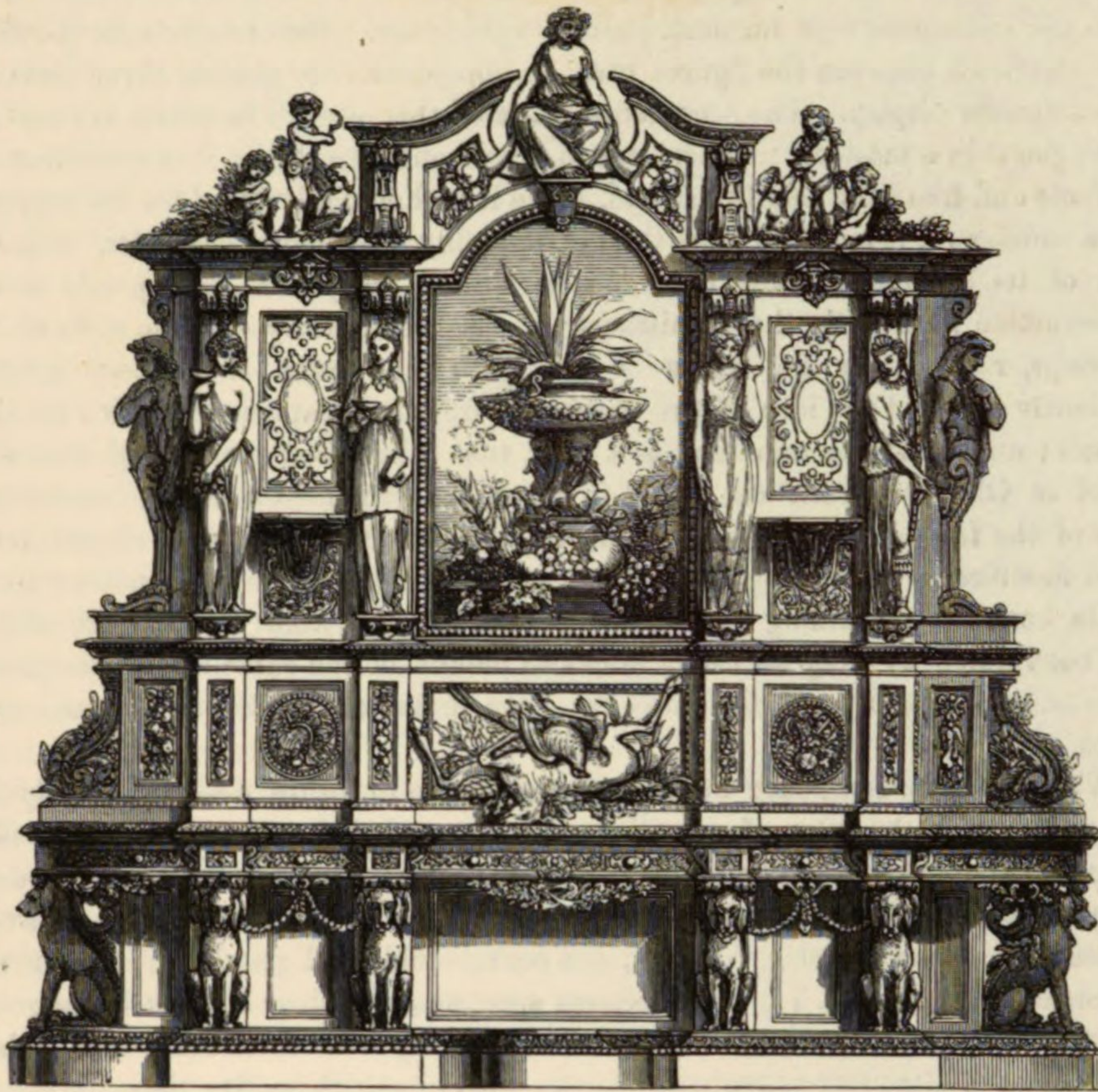
profusion as we find it on many other works. On the foreign side, as has been remarked, there is far less of this false mode of decoration, and a better sense of ornament prevails; the works are more frequently designed in the traditional styles. In France, a modification of the renaissance is principally used, and in this the ornament is in low relief and does not interfere with use; although false construction is a vice of that period, which has not been remedied in modern works, but is sometimes exaggerated.

The style of Louis XV. lingers in some of the French works; its playfulness of line and surface, its varied treatment and mixture of materials, together with its showiness, still command favour with the multitude. In the French Court (and in some works on the English side, probably of French manufacture) it is seen in its genuine character. The surfaces of these works are curved, when practicable; they are veneered in party-coloured woods, and panels are formed by or-molu mouldings, often in both instances completely at variance with the true construction; and occasionally the panels are filled with porcelain enamels, the whole having at least a gay and sparkling appearance. Some attempts have been made in the English Department to adapt ornament of this period to cabinet furniture, but it has been totally misunderstood. Instead of the treatment above described, the bold scrolls and shell forms used in the decoration of rooms at that period are here seen carved in all their coarseness on furniture. Such works bear out the remark before made, that these forms were especially adapted for gilding, and indeed, are hardly bearable, except when so treated, or when made of metal. This becomes even more apparent when full-coloured woods are used, such as mahogany; in this material the ornament is even more coarse and heavy than in lighter-coloured wood. Since, however, the vendors of cheap furniture have adopted this manner as a cheap and flashy decoration for their goods, it is to be hoped that it will soon be entirely proscribed, or retained only by such dealers.

Those designers who unreservedly adopt the ornament of past times must, of course, apply it to their works without any peculiar significance or connected idea, but merely for its beautiful forms, elegance, grace, or richness. Where, however, any significant allusion, sentiment, or happy idea can be embodied in the ornament, uniting it with the use and intent of the work on which it is to be placed, it will have a charm which the others want. Not that this want is peculiar to the application of traditional ornament, since the designer in the natural or imitative manner seldom attempts any connexion between his decoration and the work to which it is to be applied. There seems no fitness, for instance, in surrounding the frame of a pier-glass with dead birds, game, shell-fish, nets, &c., although they may be excellent specimens of carving; nor is it clear why eagles should support a sideboard, or dogs form the arms of an elbow-chair; nor again, why swans should make their nests under a table, at the risk of having their necks broken by every one seated at it: indeed, in most cases, as such imitative forms cannot in the strict sense be called ornament, they almost challenge inquiry as to why they have been adopted, and disappoint us when we find it has been without motive: this is not the case with traditional ornament, which, like the current coin, is accepted at once without inquiry.

The sideboard, carved in walnut, as here shown, and which is exhibited in the French Court, by FOURDINOIS (France, No. 1231), is an apt illustration of ornament

having a just and characteristic significance. This piece of furniture is of rare excellence and merit in design, and of skilful and artistic execution as to carving, and,



although of a highly decorative character, is fitted for the purpose for which it is intended. Six dogs, emblematical of the chace, resting on a floor of inlaid wood, support the slab, which has a simple carved moulding along its front, and is inlaid in geometric forms. The dogs are not merely imitative, but are treated as a part of an ornamented bracket or console, thus composed architecturally for bearing and support. Above the slab, standing on four pedestals, are female figures, gracefully designed as emblems of the four quarters of the world, each bearing the most useful production of their climate as contributions to the feast. Thus Europe has wine ; Asia, tea ; Africa, coffee ; and America, the sugar-cane. In the central space between the pedestals, which is rather the widest of the three, the products of the chace are poured out on the very board, and above this the space is filled with a framed picture of rare fruits, giving an opportunity to enliven the work by the addition of colour, without militating against good taste ; above the figures, which are treated as statues, the cornice is bracketed, and supports boys with the implements of the vineyard and of agriculture. It rises into a pediment in the centre ; this is broken in the manner of the renaissance, and decorated with a figure of Plenty crowning the group. The upright line of the back is gracefully varied at the sides, and constructively strengthened by carved brackets, above which

are terminal figures bearing the implements of fishery on the one side and of the chace on the other. The panels of the pedestals and of the side compartments below are filled with carvings formed of the fruits of various countries, grouped with the instruments of horticulture and agriculture. Two brackets on the side compartments between the figures give an opportunity for placing silver plate in a position for display. The ornamental parts of this piece of furniture are carved throughout in a masterly manner, and in a bold and free style; it is consistent as a whole and free from puerilities, and, while it is thoroughly fitted for its purpose as a sideboard, it is at the same time of a highly ornamental character, without any of its decoration being overdone or thrown away. It corresponds in its constructive form with the renaissance of the 15th century,—in the style of its carvings, rather with the works of the 13th; the gates of Ghiberti having evidently supplied the idea of the groups of fruit and implements which fill the panels; and it may be remarked as a fault, that it has been overlooked that the relief in Ghiberti's work was suited to metal, the ornament standing beyond the face of the framing of the panel; but in adapting it to wood this should have been modified so as to bring the impost of the carving within the surface; such faults, however, are trifling in a work otherwise of great ability. The care which has been taken to keep all the ornamental details in the same scale throughout is an additional merit, and the wood has been judiciously chosen as to colour and grain.

When we turn from such works as the above to furniture designed strictly in accordance with the rules of a traditional style, we feel that there is often a cold propriety about it which requires consideration before we can admire it; yet among such are some of the best works of the Exhibition. The wardrobe of T. F. WIRTH, of Stuttgart (Wurtemberg, No. 70); the console-table and glass of A. BARBETTI, of Siena (Tuscany, No. 74), are excellent specimens in their kind, well designed constructively, and ornamented in exact conformity with the renaissance style; the cabinet of RINGUET-LEPRINCE (France, 1437) has high merit; the ornamental treatment of a picture-frame by M. J. LIENARD; the cradle in the Fine Art Court (353), so skilfully carved in boxwood by W. G. ROGERS, from a well-composed design by his son, W. HARRY ROGERS, also; and a sideboard by a student of the SCHOOL OF DESIGN AT SHEFFIELD. With these exceptions, the best works are in the French Furniture Court, although in them the style is often mixed, and the constructive faults of the renaissance have been adopted as well as the ornamentation. In other styles, perhaps, the best example of a careful adherence to tradition is observable in the furniture of the Mediæval Court, as in a Gothic sideboard really fitted to display a service of plate; a carved oak cabinet bookcase, by J. G. GRACE (Cl. XXVI., No. 530); and other works. These are particularly to be commended for their sound constructive treatment, and for the very judicious manner in which ornament is made subservient to it. The metal work is also excellent, and the brass fitting of the panels of the bookcase deserves to be studied, both for the manner in which it has been put together, and for its graceful lines. The candelabra of the sideboard also are sensible forms, without any unnecessary ornament. Such furniture in old times was often ornamented with mottoes or texts, a practice which might well be revived, as having far more significance than the commonplace conceits of much of the ornament of the present day. It

may perhaps be objected that the general forms of furniture in this style want variety, and this is rendered more apparent by the florid lines of many of the works around them ; but the principal reason will be found to arise from a due consideration of the true constructive treatment of *wood*, which is ill adapted to curved forms on account of its grain, and requires horizontal and perpendicular lines as the basis of framing. The ecclesiastical character of the works in this Court has been already alluded to. It must be remembered that the spirit of the age from which they have been adopted was to bring a sense of the pervading authority of the Church, and the *outward* forms of religion, at least, into all the offices of daily life. This was altogether changed when the revival of ancient learning and of ancient art destroyed the Christian symbolism of ornament and deluged the Roman Church with decoration derived from Paganism, and consequently entirely opposed to the true spirit in which all ecclesiastical ornament should be conceived. The change in ecclesiastical decoration soon pervaded domestic furniture also, and ornament lost all significance and symbolic life. Some credit, therefore, is due to the revival of a better and purer state of things, and a return to the old paths and avoidance of the present mere sensualism of ornament. Yet it is not on this account, but as examples of careful and strict adhesion to true *principles* of construction and ornamentation, that the works in this Court are so often alluded to ; they deserve commendation for their illustration of truth, and as showing what one man, by earnest and well-directed attention, can achieve in the reformation of taste, and in the training and forming of other minds to assist in his truthful labours. Their unity of character, moreover, is not the least among their many excellences.

The cases of musical instruments have been barely alluded to in this section of our Report, although they must be classed under the head of furniture. Such works, exhibited in various parts of the Exhibition, display a vast amount of labour entirely thrown away, and tending only to vulgarize that to which it is applied. Some pianofortes are entirely covered with inlays ; some with gilding ; some have pillars that support nothing, and carved brackets applied to no purpose. There is little harmony to the eye, however much may be produced for the ear : common sense, nevertheless, would seem to require simplicity in the exterior decoration, that one organ may have rest while the other is occupied. The thought indicated by the ornament is frequently most commonplace, being often that of a whole concert of musical instruments around the one ornamented, or their substitution for brackets, columns, or legs. There seems to be as little invention as fitness in adapting lyres as legs to pianofortes, yet this has been resorted to, whilst any consideration of a better mode of *applying* the support, especially in the case of grand pianofortes, appears to have been overlooked. Some of the best makers, both native and foreign, have contented themselves with carefully selected woods of choice grains, enriched by carved or gilt mouldings only, and have justly relied rather on the merits of their instruments than on the gaudiness of the cases. This is, at least, sensible, since the ornament of such works is quite supplementary, and will less bear overdoing than on many other articles of cabinet furniture.

Inlays of metal, mother-of-pearl, or tortoiseshell, may be introduced with excellent effect in furniture ; but they must be used sparingly. Such a marvel of labour as the table exhibited by PEREZ (No. 271A), in the Spanish Court, of course

does not come within the scope of this remark ; the subdued colour of the wood used, and the forms chosen, are nevertheless so judicious, that as a piece of ornamental inlay it is excellent for its art, as well as from its curiosity as a feat of labour. Some of the buhl cabinet furniture in the French Court may be instanced as showing that an excess of really beautiful ornament tires us, and causes meretriciousness. There are some excellent specimens of geometrical wood inlays for furniture exhibited by MARCELIN (France, No. 606), and the inlaid top of a table among the furniture by LEISTLER, in the Austrian rooms, has much merit ; such inlays come under the same general laws as mosaics, which have already been treated of ; requiring great simplicity and perfect flatness. The table (No. 112), in *pietra dura*, by BOSCHETTI (Rome, No. 17), consisting of a wreath of orange-flowers, bordered by a simple line, is in the purest taste ; the more costly one near it is marred by the introduction of a band of architectural ornament, contrasting far too strongly with its ground,—a fault worthy of notice, as it prevails largely in similar works.

The furniture in *papier maché* is almost wholly of English manufacture ; it is derived from the old importations from Japan, but has gone far beyond such goods in its excess of decoration : it is the most gaudily decorated of all manufactures, and seems quite beyond the pale of any just principles of ornament. There is no apparent reason why this material should not be used for chairs, couches, tables, or cradles ; but the art of designing for it is not yet attained : as the material possesses peculiar properties of strength and lightness, without needing any framing, it should be considered purely for itself, and the designer must forget all other constructive forms. As to its ornamentation, the sooner it has a thorough revision the better, since at present it is a mass of barbarous splendour that offends the eye and quarrels with every other kind of manufacture with which it comes in contact. The simple lacquered work of India may afford an example for the ornamentation of *papier maché*. Figs. 2 and 3, plate 3, are specimens of lacquered ware taken from the tops of small boxes in the Indian Department. The purely ornamental treatment of the forms and their elegant flowing lines, with the agreeable manner in which both gold and colour are dispersed over the surface, is a lesson of richness without gaudiness worthy of the attention of the manufacturers of *papier maché* : and when it is remembered that this ware is of the commonest and cheapest character, it serves to show that vulgar forms and bad ornament are not necessarily connected with cheap manufacture.

Some of the greatest faults in the furniture of the Exhibition are its unsuitableness to uses, and its false construction. Look, for instance, at the costly articles of the Austrian rooms, and it will be found as skilful in execution as it is deficient in adaptation to its intended purposes. The bed looks more fitted for a corpse to lie in state on than for a place of repose ; it is a congeries of parts without an object : the footboard is so high and solid, that it shuts in the sleeper as in a prison, and completely impedes the free circulation of air ; the footposts rise from massive purposeless bases, and dwindle into mere sticks as they approach the heavy canopy ; the wood selected is unsuitable for carving, its party-coloured grain blurring the ornamental forms. In the other furniture like inconsistencies appear ; in the cabinet, large spaces are thrown away, and therefore, though occupying much room, it has little that is available for use ; the centre space, with its canopy

(though pretty), has no apparent purpose, and it is quite disproportioned to the size of the wings, besides being deficient in the appearance of support. The bookcase has the same fault of room thrown away and of unsuitableness to use, besides being a false adaptation of Gothic stone forms to wood-carving. This latter fault is elsewhere also largely prevalent; it is an error in most of the Belgian furniture. Thus we have a wardrobe which would be more characteristic as an oratory, and a bookcase with arches that support nothing, and buttresses which have no thrusts to resist. Indeed it should be remembered that the *arch* is not a wooden, but essentially a stone construction; it will be evident, on a moment's consideration, that it is a means of obtaining support by a number of separate small parts, the reverse of timber construction. It ought, therefore, to be well considered before being used in wood, wherein it should arise rather from coupled knees or brackets introduced to strengthen horizontal beams, than as an independent form. Its improper use will also be seen in various sideboards on the English side. In these the back consists of a mirror, over which a wooden arch is thrown; the glass having the effect of a void or opening; the thin wooden arch, bearing nothing, not only has a meagre appearance, but, having nothing to sustain its thrusts, is quite as much at variance with the use of the materials as it is with a proper sense of construction. One of the best of such treatments is seen in an elegant cabinet and mirror exhibited by Mr. SNELL (Class XXVI., No. 170), wherein a light inner column and arch, metallized by gilding, is introduced with good effect; even here, however, the pilasters which support the outer arch seem to want brackets at the sides of their base to give more appearance of support, for the introduction of which there is ample space; the small abortive ones which are used serving only the more directly to point out this want.

Sham construction is another error alluded to, not only of the kind before spoken of,—the suppression of the true constructive forms, as panels, framing, &c., and giving undue prominence to others,—but also where those portions which are intended for support (as, for instance, columns in cabinets, legs in sideboards, &c.) are made to move from under the parts intended to be supported when opening the doors of the furniture. This is a common case in cabinets designed in the Renaissance style, and has the authority of some of the best antique specimens; nevertheless, it is a constructive fault, and is instanced because it is the source of many like errors of a more glaring kind, as where legs are made to remove, or where the whole front of a cabinet or wardrobe is made into doors hanging to the sides without a framed facia and hanging style, and both the side and centre columns (where columns are so used as decorations) are made to move with the doors.

In reviewing the furniture of the Exhibition, the question of the education of the art-workman again comes prominently under review. While it must be confessed that the general design of the French works in this class are greatly in advance of our own, it is also apparent how much more widely diffused in France is that art-knowledge, which, combined with handicraft, constitutes the true art-workman. Although this is peculiarly seen in works in metal, it is evident in many other branches of industry. Wherever the human figure is used as ornament in English works, it is pretty sure to be faulty: the figure may be well composed, may be evidently designed in good taste, since that is often the work

of a superior artist; but in the execution it is almost always disfigured and spoiled. The extremities are finished without knowledge of the internal structure, the fingers, toes, and joints have no bones within the skin, but that "gummy" undecided treatment which evidences the ignorance of the workman. In wood-carving this is equally apparent, even when it consists only of ornamental forms. Very often in such work the "design" of the ornament would seem to be by the same unskilled hand that carved it, since it is mostly out of place, coarse, and merely "natural" in style, and rarely reaches beyond the expression of the most commonplace thought, or the imitation of the commonest fruits and flowers, that great power of imitation and skill of hand, however, are not wanting in the English carver, is evident from many examples, and is particularly shown in the beautiful and delicate flowers, &c., of T. W. WALLIS, of Louth (Fine Art Court, Class XXX. No. 89), which are quite equal to the French works in the same style; but even these go no further than imitation, and the human figure cannot be carved by a merely imitative process:—success in rendering either the human figure or animals when in life and motion can only be the result of knowledge attained by a careful study of the structure of the bony frame-work and of the moving muscles; and it is the want of such anatomical knowledge and of a proper training in art that causes the deficiency we are obliged to notice in the English Department, and compels the carver to confine himself to mere works of imitation, knowing that higher are beyond his powers.

The two figures in the front of the cabinet of RINGUET-LEPRINCE, for instance, are unapproached by anything in English furniture; as is the rare excellence of the carvings on the sideboard of FOURDINOIS, and the works of LIENARD. Even where the figure has had a partial study, the imitation is often cold and "mannered;" the letter is followed rather than the spirit, and it is almost impossible to find a workman entering into the feeling and spirit of the artist-designer, and treating the work in a good and bold style. The bronzes of men and animals are perfect instances, in French works, of the power of the workman to enter fully into the feelings of the artist, and to appreciate style and intention, but the same union has hardly anywhere been attained by the English workman. The Belgian carvers, with Geerts at their head (a perfect artist in wood), are advancing in the same direction, and it must be allowed that the Austrian figure carving, as shown in the furniture of LEISTLER, is much beyond ours, while the Berlin casting and chasing of small works is fast rivalling the French, and in some cases is in a much purer style. The carving of Italy is careful, but tame, and inclined to littleness; this will be seen by comparing the style of the children in BARBETTI'S table and mirror, a work otherwise highly commendable, with the gusto and vigour—the larger manner and bolder treatment—of some of the French works. The children on a small scale in the bookcase of HOLLAND and SON, which contains some otherwise good carving, show the timidity of the English art-workman when he has to deal with the figure. Some very small panels, carved in white wood, on a sideboard by J. M. LEVIEN, are in better style, although very minute, but the general want of knowledge is too apparent. This deficiency of power and skill in the human figure is only an additional evidence of the want of better education for our art-workmen. They need to have proper treatises prepared for them, laying down the principles of ornament, and giving them a thorough foundation in practical geometry, form,

proportion, and, above all, in anatomy, together with a careful education of the hand and eye; and unless the Government and the manufacturers of this country are soon awakened to our deficiencies, and prepared to make great sacrifices, we must be content to lag still further behind as the world advances, and for the future to be manufacturers of cheap goods, leaving excellence and beauty to our continental neighbours.

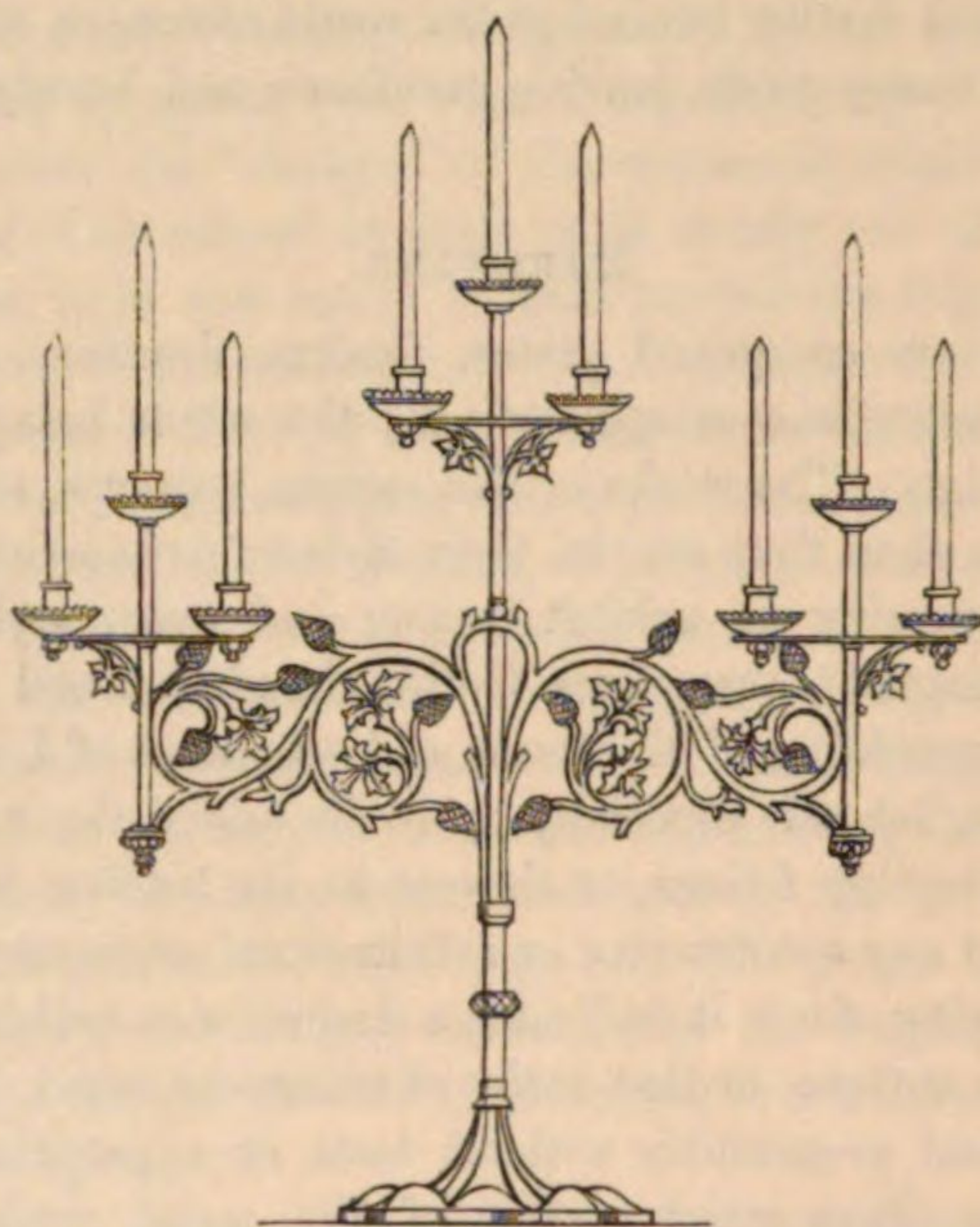
HARDWARE.

Under this head are comprised grates, fenders, fire-irons, stoves, gas-fittings, lamps, and various miscellaneous applications; the whole being largely connected with ornamental design. The works in this section, however, are not more miscellaneous in their use than they are in their style of ornamentation, almost every manufacturer endeavouring to exhibit in any and every style. Thus we have Greek candelabra adapted to many uses, Gothic chandeliers and Renaissance lamps, with a pretty large sprinkling of the forms and ornament of Louis XIV. and XV., to which, on the English side especially, is to be added the *natural style* before alluded to, which, adopting foliage or flowers as its leading idea, presents them as they grow, without any constructive or architectural arrangement whatever. Yet even this is encouraging, since it indicates a desire for something more than mere reproductions of the antique, or that *mêlée* of ornament which the ignorant gather from many works, and re-assemble without taste or appropriateness; it at least indicates a change. In a great portion of the metal works French taste is found largely to prevail on both sides of the Building; nor is this to be wondered at, since, for a long time, the lively fancy and invention of many excellent French artists have been directed to designing and modelling for these goods; ably seconded, also, by trained and educated workmen capable of appreciating their labours, and completing them by skilful casting, chasing, and fitting. But the tendency of the French mind towards display has resulted in over-ornamentation, and it is unfortunate that this fault is rather a merit in the eyes of the world, and has been eagerly adopted by the manufacturers of other nations, more especially of our own, that which is meretricious being retained, whilst what is really excellent in French design, and especially in French workmanship, is overlooked by them, or is unattainable.

Moreover, whilst the most able French artists in metal, eschewing the gaudy style of Louis XV., have returned to a modified form of the Renaissance, and have given it somewhat of newness of character, the English designers for hardware (with a few exceptions) either still adhere to the contorted style first named, or produce works composed of ornaments pirated from all times and all nations, put together without any sense of construction, without selection and without fitness. Such works are a thorough chance-medley that disgrace our manufacturers, and make us look back to the simpler forms of the middle ages with respect and regret.

Let any one examine the characteristic simplicity of the candlestick here engraved (exhibited by Messrs. HARDMAN, from a design by Mr. W. Pugin), adapted as it is for use, standing firmly, capable of being handled, light, yet strong, and compare it with the showy works around it, so *ragged* and tangled with ornament that all characteristic form is lost, branched arms bristling with foliage weighing down rather than bracing and supporting them, with perhaps a bunch of flimsy

chains dangling in the way of those who would touch or lift them, or two or three Parian Cupids basking at the foot, or bearing up the candles; and where the



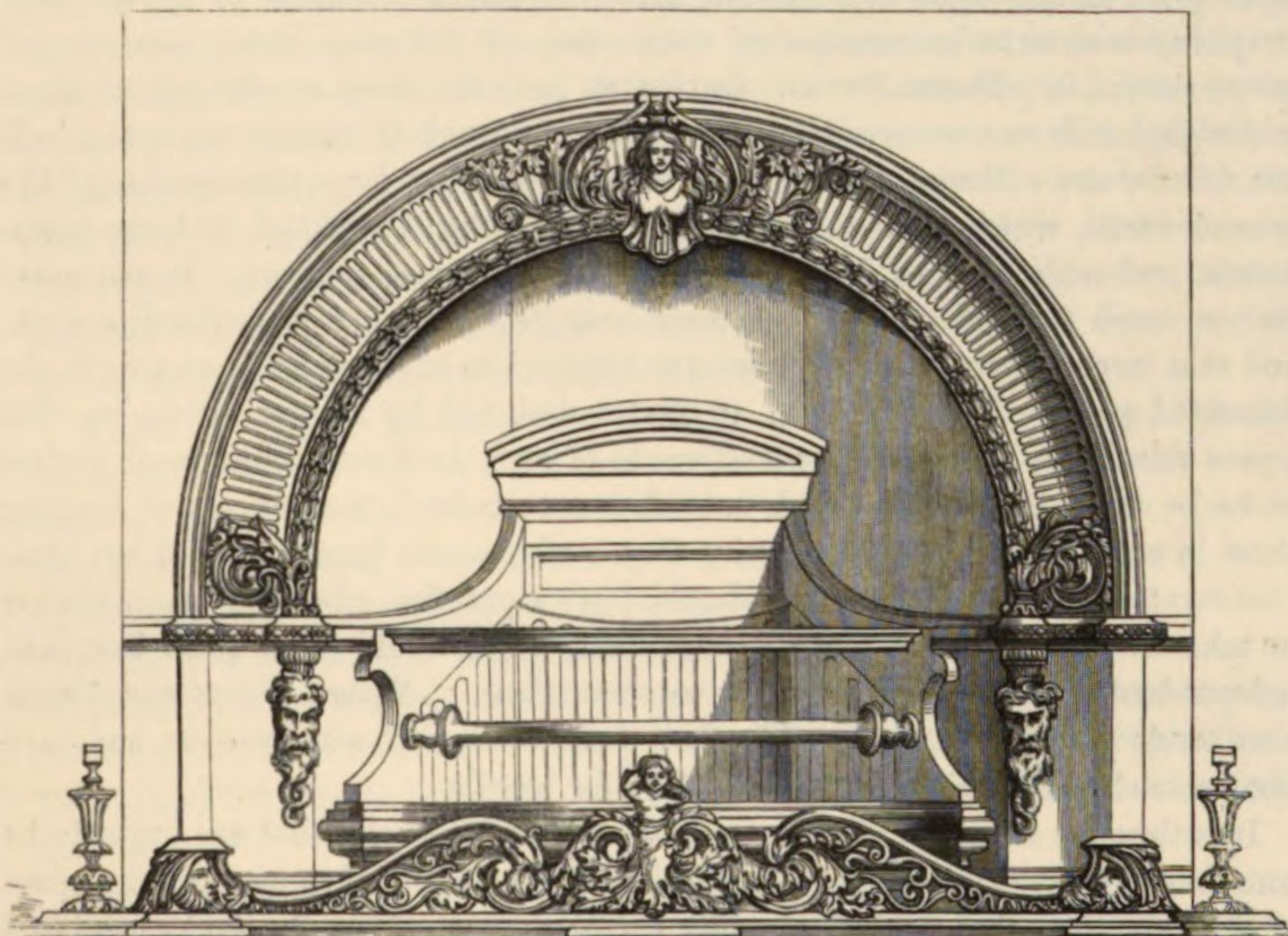
hand should grasp the stem to lift the candelabrum, the ornament so sharp and thorny that to touch it would be impossible. In making such a comparison can we do otherwise than feel that the one is honest, useful, characteristic, and therefore beautiful, whilst the others are flashy and grotesque, full of little prettinesses, which some misname "ideas," put together without any leading motive, and having no definitive character or true construction?

The faults of English design for hardware are obvious to every one; the error of the French designers is equally open to the most superficial observer. In the great mass of these works there is no rest for the eye—the whole surface is nothing but ornament. Thus, for instance, the French art-bronzes have justly obtained a wide reputation, and the works of Denière, Pradier, Méné, and other French artists, are sought for all over Europe; but when such become a part of manufacture, and liable to be classed as hardware, art is overlaid with ornament, and the skill of the workman is directed to that which degrades the work, and sadly militates against good taste. Thus, figures designed with much fancy, and modelled with ability and vigour, are vulgarized from the imitation of fur and of the texture of the garments, of buckles, buttons, and ties of the dress, of chain or plate armour or weapons, whilst the homogeneity of the bronze is no longer retained, but various parts of dress are treated in various tints of the metal; and all the different qualities of surface, such as tooling, frosting, and burnishing, in which it is but just to say the workmen are most skilful, are brought into play to *enrich* the effect; while sometimes we have, in addition, combinations of many materials, such as marble, porcelain, ivory, and bronze, united in a single work.

Another class of works are those anomalous candelabra composed of porcelain

vases filled with a bunch of flowers in or-molu, a few bearing candles amongst a number of barren branches, the whole being a bush of glitter and burnish. This is the direction which naturalism in ornament takes in France. Such works have a total absence of constructive feeling, and an equal want of proper treatment of metal; to add to their finery, an *épergne* of artificial flowers is often mixed up with metallic ones, as a centre-piece for the dinner-table. There are many large candelabra in various parts of the Exhibition—in France, Holland, Austria, and Russia—which evidence the wide dispersion of French style, and contain exaggerations of the most frequent French faults. The error, however, does not wholly rest with the designer, since it will be long before he has a public sufficiently educated to relish the amount of plainness which is absolutely necessary to give the true value to each part enriched.

Grates.—Grates rank among the principal works in hardware to which ornamental design is applied, at least on the English side, and there by far the best specimens both as to design and workmanship are to be found: this was to be expected from the general necessity for warmth in our cold and variable climate; an Englishman's love for his fireside having passed into a proverb. It is gratifying also to see that the design and decoration of these goods have greatly improved in the last few years. Some works of great merit are to be found among those



exhibited, while the workmanship generally is excellent. There is, however, an evident tendency to do too much, and it is incumbent on designers for such goods carefully to avoid this, and to endeavour to restrain manufacturers from such treatments of the metals as lead to gaudiness and glare, and by which, at the same time, the grate itself is rendered less useful. The great secret, after constructive use has been considered, consists in the proper and judicious treatment of the materials, which offer great advantages for contrast, either with or without the

introduction of bronze or or-molu. True excellence will be found to be closely allied to simplicity—a moderate use of ornament and of the burnisher, and the contrast of broad flat masses of plain metal with ornamented or burnished mouldings, with inlays of brass, or with bronze and or-molu ornaments. The arched form which has generally been adopted for grate-fronts is architecturally suitable and agreeable in outline, giving ample opportunity for ornament in the mouldings of the arch, as well as in the spandrels, besides having sufficient surface of metal to contrast with; moreover, it is not likely to interfere with the architectural arrangement of the mantel-piece to which it may have to be fitted. Messrs. ROBSON and HOOLE exhibit several grates designed by Mr. A. Steevens, highly decorative in character, and of great general merit; two especially, fronting on the Central Avenue, designed in the Renaissance style, evince great artistic ability. The one engraved, however, which is exhibited by them, is more constructively simple, and sufficiently ornamented for its office as an article of furniture, while it displays most judicious use of the material. The face is of ground cast metal, the ornamented moulding of pale bronze, with the leafage of brass, and the figure bronzed, while some semi-burnished lines about the fire give a very chaste and tasteful effect; the fender is also of bronze and brass, with the leading lines burnished. Much more ornament than this would raise the grate out of its right place in the scale of furniture, and draw undue attention to it; its sober simplicity is more to be commended than many of the very highly ornamented grates around it. Messrs. STUART and SMITH have also some meritorious works as to design, but from the excessive introduction of burnished surfaces the grates look too fine for use. Messrs. Hooley have avoided this by a large introduction of the ground metal, which contrasts excellently with either burnished or brass ornaments, and adds to their beauty by its own repose and sobriety. It can never be too much insisted on, that ornament loses its value when it overloads a work, and that large unornamented spaces are required to enhance and give zest to the decorated parts. As we descend to grates designed by inferior artists, we find excess substituted for excellence, and works of such brilliant gaudiness of surface as to be quite unfitted for their intended use; indeed, the process of keeping them in order would seem to require that a whitesmith formed part of our establishment, or that the housemaid should have a practical education to enable her to take to pieces the elaborate constructions which would come under her care, independently of the skill required to clean them. Messrs. Stuart and Smith have made attempts at the combination of materials with some success, and have also some cleverly designed metallic inlays for hearths.

It is tiresome to repeat what has so often before been said, that use ought to be considered before ornament; yet no section of furniture suffers more from neglect of this rule than that comprised under hardware, not only in the works exhibited in the British, but in all parts of the Exhibition. In some cases this shows itself in applying a form or construction suited for one use, to another for which it is quite inapplicable. Thus some chandeliers in the French Court, which at first sight seem cleverly designed and a skilful treatment of the metal, on examination are found to consist of a large central lamp, which alone is intended to give light, surrounded by a circle of branches bearing sham candles, not intended or prepared in any way for illumination, but introduced merely to allow of a little extra

ornament. From the same cause results the impertinent *application* of figures, in bronze or in Parian; a fertile source of bad taste. These are too often merely added to the work, and not constructively treated, and thus seem to have no real relation to the forms they are connected with. Hence the manufacturer is enabled to adapt the same figure to many purposes, and to the most opposite uses; sometimes at the base of a chandelier, sometimes at the top, and sometimes perched upon the branches. Profitable to the manufacturer this may be, but it is as completely opposed to every just principle of design as to every hope of progress or good taste.

In the treatment of metal the rendering of the surface demands the most careful study, since much of the beauty of a work results from this being properly understood. No doubt the true lustre of metal is only given in the burnished state; but when burnishing is introduced in any quantity it becomes not only tormenting to the eye but wants contrast to bring out its brilliancy. Moreover, by its glitter it obscures ornamental forms, which rarely look sharp or clear in their details under this treatment. When figures or animals, introduced for decoration, are burnished, their true form is almost undistinguishable on account of this glitter and the reflection from the polished surface, besides the pressure of the tool completely destroying all details of form and surface. Yet many important works (a clock in the Russian Court may be especially instanced) have the figures entirely burnished. The evil caused by a glittering surface in such works is duly appreciated by the French artists, who have wisely adopted bronze as the material for figures in the baser metals, and have overcome the difficulty by oxidation in their works in silver. A medium state of the surface between mat and burnished, though much to be desired, is not always obtainable, nor has it perhaps been sufficiently sought. Bronze, however, from its colour, partially supplies this want; and the mixed metals, and ground cast-iron from its duller polish, afford good contrasts to burnished iron or steel.

While our use of burnish often tends to blur and destroy form, the older workmen took advantage of a polished surface to produce ornament; this may be seen in some of the old church chandeliers, of which the central trunk, consisting of a plain turned boss, seems richly reeded when the branches are lighted, merely by the reflection of the lights on the metal.

In most of the modern works, burnished and matted surfaces seem to be used indifferently or at random, instead of applying the burnisher to give variety to recurring forms, or to enhance leading lines. These are often entirely matted or tooled, and those parts burnished which will give the greatest flutter and glitter to the object.

The *natural* taste in connection with the ornament of hardware has already been condemned. It is as false in construction as it is to all just ornamental principles.

The facilities which modern mechanism gives to the production of ornament, and consequently to over-ornamentation, have also been adverted to in the earlier parts of this Report. It is to be hoped that in view of these facilities manufacturers will see their own interest, and seek the best designs at any cost, since these will frequently be found to combine cheapness of production and simplicity with good taste. There can be no doubt that half the ornament in the Great Exhibi-

tion, and consequently the labour expended on it, is in excess ; that is to say, that a better effect might have been produced without it ; and this wasted labour might have been bestowed on the more careful completion of simpler designs, to the enriching of the manufacturer, and the great advantage of the public taste.

CARPETS.

The use of these fabrics suggests the true principle of design for their ornamentation ; which is governed by the laws before given for flat surfaces, where the object is rather to treat the whole as a background than to call particular attention to the ornamentation. Flatness should be one of the principles for decorating a surface continually under the feet ; therefore all architectural relief ornaments, and all *imitations* of fruit, shells, and other solid or hard substances, or even of flowers, strictly speaking, are the more improper the more imitatively they are rendered. As a field or ground for other objects, the attention should hardly be called to carpets by strongly-marked forms or compartments, or by violent contrasts of light and dark, or colour ; but graduated shades of the same colour, or a distribution of colours nearly equal in scale of light and dark, should be adopted ; secondaries and tertiaries, or neutralised primaries, being used rather than pure tints, and lights introduced merely to give expression to the forms. Under such regulations as to flatness and contrast, either geometrical forms, or scrolls clothed with foliation in any style, leaves, flowers, or other ornament, may be used, which, with borders and compartment arrangements, and the use of diaper treatments, leave ample room for variety and for the inventive skill of the artist. It may be thought impossible or unnecessary to confine the designer too strictly by such laws, and they are, indeed, rather stated from a sense of their truth than with an immediate hope of their thorough acceptance, but at any rate they may serve as curbs to extravagance of design, and as guide-marks to lead back the errant designer to the path of consistency. In speaking of designs for these articles we turn first to France, both as the largest contributor of designs generally, and because the importance of her national manufacture of these fabrics must claim for them our first consideration. Three of her principal ornamentists exhibit designs for carpets ; two of them, however, seem to consider any such principles as those given entirely unnecessary : their works might as well be florid designs for the decoration of ceilings, if such a false system could be applied anywhere. Thus one of the most important carpet patterns of one of these artists bears a deep border of architectural decoration shaded in relief, consisting of shields and scrolls of the Louis Quinze period, with wreaths of flowers rendered imitatively and in perspective. This border seems thrown downward, to form a reversed coving ; within the field of the carpet, as in a mirror, is a forest, with the sky seen through the central opening between the branches, whilst amorini, almost as large as the trees themselves, sport beneath their shade or float in mid-air. The principal work of the second is of a like character, with trees and flowers, fountains and statues, earth and sky, mingled on the surface of the design, in total contravention of those laws which have been presumed to be just ones for such a purpose. The third artist, M. CLERGET, both in his carpet and in his other designs, forms an honourable exception. Flatness, a just ornamentation, and a quiet distribution of colour being the consistent results of his labours. With regard, however, to the

two former, it would be unjust not to speak of the great executive skill, the knowledge, and clever arrangement observable in their works. These, however, by their attraction, only increase the evil such designs foster. The results of such false principles are apparent all over the Exhibition, and are plainly visible in the carpets and hangings exhibited by France. To begin with the establishments which, under royal or national aid, have carried these fabrics to the highest pitch of excellence in all that relates to skill of manufacture, brilliancy of colour, and magnificence of design. In the face of the many and rare excellences they exhibit, both of handicraft and scientific knowledge, the chemist and the botanist having united their sciences with the invention and taste of the painter, it is extremely daring to reprobate the ornamentation of these costly works; but the designers who have laboured for them have, by these very excellences, so largely contributed to the spread of bad taste and false principles in such fabrics, that it becomes a positive duty, in the face even of the highest authorities, to object to the principles on which they are ornamented, if we would place carpet designs on the right footing for the future. That the stream is impure at the fountain head has been shown in reviewing the designs, where the artist, exhibiting what should be specimens of his own taste, has fallen into the false taste of the public, or rather outrun it. In the manufactured products we see the result; the principal carpets exhibited combining a mixture of ornament with natural or imitative flowers, designed with the greatest skill, coloured with the tints of nature, and gracefully and tastefully disposed; the ornament, however, is purely architectural, and in shaded relief, without any sense of flatness; and consists largely of the broken curves, the coarse scrolls, and the shell forms of the Louis Quinze period. In the carpet from the manufactory at AUBUSSON (No. 1499, France) the contrasts of colour, both as to tints and light and dark, are of the most violent kind; distressing the eye, and distracting the attention from any works which might be in juxtaposition with it. The carpet from the GOBELINS MANUFACTORY is less objectionable in its contrasts of light and dark, and is highly skilful in its arrangement of colour, but it has the same erroneous use of it, the same adoption of the ornament of another material, the same florid taste and want of flatness. It may be said that these works, designed for the gorgeous magnificence of palaces, can hardly come under sober rules; that they are essentially intended for display. Even allowing this to be the case, such specimens may well serve as warnings of the danger of adopting the like style for more general uses; and even in a palace, the chaste simplicity of its statues, and the subdued hues of the works of high art which should adorn it, could stand little chance of vying with the richness and lustre of fabrics so over-decorated; and the princely inhabitant would certainly share the attention of the spectator with the gaudy carpet which covered the floor.

The English designers contribute less to the Exhibition than their French neighbours, and, although their works are behind the others for skill and execution, some are in a far more sober and just taste. The designs exhibited by the students of the Government School of Design are of this number; being the works of students, it can hardly be expected that they should abound in invention, and we ought to be satisfied to find that good principles prevail in them. There is a good design exhibited by J. K. HARVEY in the Fine Arts Court

(Class XXX., No. 119), and two or three of inferior excellence in other parts; but it may be fairly said that our carpet designers, as a body, have not sent evidence of their skill to the Exhibition, but are to be judged of rather by the fabrics themselves. With the exception of France, already remarked upon, no other nations have contributed any designs.

On turning attention to the manufactured goods, they will be found to consist of such a confused mixture of styles, and to exhibit such a total want of consistency, that it is at once evident the designers, both at home and abroad, are amenable to none of those *principles* which have been explained as governing the decoration of carpets. It is true that among the number of works exhibited there are many of great skill and ingenuity of decorative treatment, of rich combinations of colour, and which nearly approach to excellence; but it is nevertheless obvious, even from their extreme variety of style, that designers and manufacturers feel themselves bound by no laws, and perfectly at liberty to adopt any or all modes of ornamentation, without regard to what is suitable for the material or the uses which the fabric is meant to subserve.

The French designs applied to carpets are largely characterized by the works already remarked upon, the prevailing faults of these being the prevailing faults of the large majority of their works—architectural relief ornament, perspective treatments, want of flatness, crudeness of colour, harshness of contrast, and want of relative scale in the ornament, pervading the greater number of their works. Three imitations of Persian rugs from the NATIONAL MANUFACTORY at BEAUVAIS, from their flatness, quiet contrasts, and broken hues of negative colour, show to great advantage in connexion with the works around them. Nor can it be said that the other European exhibitors follow any sounder principles of design, either in their national workshops or in the general labours of their manufacturers. The prevailing taste of France seems to be that of the continent generally, but with less excellence of details, skill of arrangement, and knowledge of art; and although here and there works of much merit may be exhibited, the absence of true principles is everywhere apparent.

The English carpet manufacturers are large exhibitors, and on the whole the decoration of their best goods may be characterized as less extravagant than the foreign ones, not, however, that there is here any acknowledgment of sound principles, or complete repudiation of false ones. Thus sometimes, as in the carpets of the Mediæval Court, and in those exhibited by Messrs. NEWTON, JONES, and WILLIS, a flat floral ornamentation and geometrical arrangement has been duly attended to, but the contrasts are too strong, or the necessary sobriety of colour is not obtained. Sometimes floral decoration has been used, as in the carpets exhibited by Messrs. TUBERVILLE, SMITH, and Co., WHITE and Co., HENDERSON, WIDNEL, and Co., BROWN, MACLAREN, and Co., WATSON, BELL, and Co., and by Messrs. JACKSON and GRAHAM, all which have much merit, but the flowers are often far beyond the natural size, the colours are bright and gaudy, and flatness is not attempted; in short, imitation and not ornamentation has been the rule of the designer. The last-named manufacturers exhibit a carpet designed by John Lawson, which, as greater attention has been paid to ornamental requirements, is given in the accompanying impression. In the carpet itself the border is about half its width too narrow for the centre, but this is not seen in the woodcut; the

colour of the centre consists of gradations of a neutral red, the forms of the border are red on a dull white ground. While it is one of the most commendable of such fabrics, it will serve to illustrate the error of indiscriminately applying the ornamentation of one material to that of another. Thus the design, taken from the excellent work on the Alhambra by Mr. Owen Jones, and there used as a wall decoration, where its "up and down" treatment was characteristic and proper, is no longer so when applied to a carpet, since this requires an "all-over" treatment, or an arrangement towards the centre, a consideration which does not seem to have entered into the mind of the designer. Messrs. WHITE and Co., and Messrs. WATSON, BELL, and Co., exhibit carpets of great merit, imitative of those of India and Turkey, and it is only necessary to turn to them from the surrounding works to be convinced of the justness and truth of the Eastern style and application of colour to such fabrics; indeed a most careful examination has confirmed a strong feeling as to the great superiority of the designs of Indian and Turkish carpets, both in the arrangement and general tone and harmony of the colours, and the flat treatment and geometrical distribution of form. The Turkish carpets are generally designed with a *flat* border of flowers of the natural size, and with a centre of larger forms conventionalized, in some cases even to the extent of obscuring the forms, a fault to be avoided. The colours are negative shades, of a medium or half-tint as to light and dark, tending rather to dark, with scarcely any contrast, and therefore a little sombre in character. Three hues are principal and largely pervade the surface, namely, green, red, and blue; these are not pure but negative, so that the general effect is cool, yet rich and full in colour. The colours, instead of cutting upon each other, are mostly bordered with black, the blue has a slight tendency to purple, and a few orange spots enhance and enliven the effect. The distribution of colour in these fabrics is far simpler than in those from India, which last have sometimes a tendency to foxiness, from a larger admission of warm neutrals, as brown and brown-purple; they also admit of a much greater variety of colours than the Turkish. The colour of the Indian carpets, however, is so evenly distributed, and each tint so well balanced with its complementary and harmonizing hue, that the general effect is rich and agreeable; the hues all tend to a dark middle tint in scale, and white and yellow are sparingly introduced to define the geometrical arrangement of the forms, such arrangement being the sound basis of all Eastern ornament. The illustration given in Fig. 1, Plate 1, is from an Indian rug, and will illustrate the various principles, and the tone of colour contended for. A large silken carpet and a smaller one, exhibited by the HONOURABLE THE EAST INDIA COMPANY, are fine examples of the skill and taste which are evidently traditional in the Indian races.



Having spoken thus highly of the decoration of such goods in India, it is painful to observe the attempts ignorantly made to vitiate the sound taste of the native artists. It has no doubt been done by those who are unaware of the true knowledge and just principles evident, more or less, in all the Indian manufactures; but it is not the less necessary to be commented on, since a school of industry seems actually in operation at Jubbulpore for teaching the reformed Thugs to make carpets in the worst European style, and at Bangalore the same teaching seems in operation. It is to be hoped that, when the admiration elicited by the display of the Indian fabrics at the Great Exhibition is re-echoed back to the land that produced them, this strange error will at once be remedied. Even if good, such patterns are not consonant with Indian tastes, and it is perhaps fortunate that they are really so extremely bad that they may fall at once before the better knowledge which the European judgment of the merit of Indian ornament will call forth and support.

The gross errors to which imitative treatments have led in the decoration of carpets have been already referred to in the general prefatory remarks, and need hardly be insisted on afresh after the definite principles which have been just given; neither need more be said on the error of adopting unchanged the ornament of other materials: it therefore only remains to remark that a certain vagueness of form and absence of flow of line in the Turkish carpets, which sometimes approach monotony, might be remedied by the introduction of strap ornament in the borders, and of diapers of flat floral ornament on the central field, under the same true principles of colour and contrast that these works evince, which, uniting the flowing and varied lines of European decoration with sound Eastern taste in tone, colour, and geometrical arrangement, would suit our climate and uses, and banish some of that trash and crudity so evident on all sides, and which has its climax in the cheap manufactures of these articles. One thing is certainly to be learned from the works referred to, namely, that bright colours are not necessarily rich or beautiful, but that tone is a great source of richness, and has at the same time the farther merit of keeping such goods in their true place in the scale of furniture. No nations exhibit greater richness of what may be called upholstery, or more gorgeous costumes, than those of India and Persia, and the wisdom displayed in the negative tone and subdued colour of their carpets is worthy of consideration, as a means of enhancing and supporting the richness and costliness of their other fabrics and their personal decorations.

Almost all that has been said of carpets is applicable to druggets and felted goods for the same uses, and the principles of their ornamentation, under certain modifications, may be applied to floor-cloths and painted cloth for furniture covers, as well as to printed, felted, and woven fabrics, in various materials, for table-covers.

Floor-cloths are not so much used in this country for dwelling apartments, as in halls, staircases, lobbies, and other approaches, and richness and fulness of colour are, therefore, in general, less needed. The laws which regulate mosaics and inlays for floors will, in some degree, rule these works also, except that wood inlays, especially when large, require a design capable of being framed in its construction, and of having due regard to the shoulderings of mortices and tenons, a construction obviously unnecessary in floor-cloths. It is, therefore, requisite to

guard carefully against mere imitations of such designs, and more especially to avoid all imitations of carpet patterns. Frets and guilloches for borders, and geometrical combinations for the inner field, with a centre, may be adopted when the work is large, as in the cloth exhibited by Messrs. SMITH and BABER, which has much merit, although it is too violent in its contrasts; while all-over patterns of simple geometrical diapers, in quiet, graduated tints, have the best effect in cloths for general purposes. The painted cloths for furniture follow a little too much the old Japan colouring, and are heavy and monotonous from their darkness. There are good diapers on some of the French cloths exhibited, and on some of those of GÖHRING and BÖHME, of Leipsic; but their cloths for the ceilings of carriages are wormy in line and unpleasantly crude in colour. The table-covers in woollen, cotton, flax, and silk, either woven, printed, or felted, of which there are a great variety in the Exhibition, are often characterized by the same faults as the carpets—imitative flowers and architectural relief ornament, with vases, baskets, &c., forming too frequently the details, whilst the contrasts of colour are sometimes of the most violent kind. Thus there is great richness in a cloth with a border decorated with the flowers of the *Brugmansia*, exhibited by WHITE and SONS (Class XIX., No. 343), but the requisite flatness is not obtained; and there is much merit in a Gothic pattern, with a well-coloured border, exhibited by H. and T. WOOD (Class XIX., No. 352), but the architectural decoration introduced is objectionable.

CURTAINS AND HANGINGS.

The ornamentation of textile hangings follows the same laws, and is amenable to the same general principles, as that of other wall decorations, flatness of treatment and subdued contrasts of colour being the only sure guides.

The richest, and at the same time the most sober effects in silk, are produced merely by the processes of weaving, as of satin figures on a tabby-ground, in a self-colour; and ornament properly suited for this treatment of the silk is generally in good taste, and shows the full splendour of the rich material. Next to this, graduated tints of a self-colour, as gold on straw colour, or even ornament in one colour, on a ground formed of the natural golden tint of the silk, where the contrast is not too violent, has a good effect, and shows to advantage beside those over-decorated works which are covered with natural flowers in many colours; since the lustre and gloss of the silk, and the richness of colour consequent on these qualities, are seen to the greatest advantage in the flat masses of such ornament, heightened as they are by the duller ground, while smaller parts and varied tints interfere with these inherent qualities of the material.

A hanging exhibited by Messrs. MATHEVON and BOUVARD (France, No. 1349), decorated with bunches of flowers, on an ash-coloured lilac ground, displays great ability in the designer, combined with thorough knowledge of the powers of the loom, and it has been executed with equal skill by the weaver; it is, indeed, a choice example of the style; yet its lustre and beauty, and fitness as a hanging or curtain, are not commensurate with the costliness of its production, and it cannot compete for apparent richness of material with a plain mulberry-coloured hanging, ornamented flatly in satin and tabby, that hangs beside it. Had these flowers been treated flatly, arranged geometrically, and coloured in simple tints, they would not

have been so artistic, but they would have been far more truly ornamental, and more suitable for hangings.

There are some well-designed fabrics among the Prussian silks, exhibited by G. GABAIN (Zollverein (1), No. 119), consisting of an heraldic treatment of the Prussian eagle, on a red ground, with the ornament in gold. The silk hangings of the Austrian bed are likewise in good taste. With these must be named the hangings of the Mediæval Court, and those in mixed materials, executed for the Duke of Devonshire by Messrs. REYNOLDS, of Dublin, consisting of fleur-de-lys and shamrock, in silver, on a subdued crimson ground, or in gold-coloured silk, on a watchet ground. The hangings decorated with ornaments from the Alhambra, exhibited by A. DESTRIEUX and Co. (France, No. 164), are in good taste and on good principles, as are also some in mixed fabrics, in the same style, by AKROYD and Co., of Halifax.

The *natural* treatment of flowers as the ornament of textile fabrics is nowhere seen to greater disadvantage than in the rich altar-cloths in gold brocade exhibited by French, Austrian, and Russian manufacturers. The coloured and shaded flowers instantly vulgarise and give a commonness to this essentially rich material; while diapers of colour, or a different texture produced by weaving, or silver threads woven with the gold, as in some of the Russian fabrics, have a rich and true effect.

The consideration of chintzes comes under the head of hangings; and upon these fabrics it is quite necessary to make a few remarks, since their decoration seems at present to be of the most extravagant kind. Overlooking the fact that the lightness and thinness of the material will not carry a heavy treatment, and that, in addition to all the principles which have been shown to regulate designs for hangings, the use of imitative floral ornament is peculiarly unsuitable on account of the folds, the taste is to cover the surface almost entirely with large and coarse flowers—dahlias, hollyhocks, roses, hydrangeas—or others which give scope for strong and vivid colouring, and which are often magnified by the designer much beyond the scale of nature. These are not only arranged in large groups, but often cover the whole surface, in the manner of a rich brocade. Nothing can be more erroneous, or more essentially vulgar, as would at once be evident did not fashion blind us for a time, and a feeling for costly labour and difficult execution prevail over truth and good taste.

Moreover, it is scarcely possible in such distributions of colours, whether printed or woven, to arrange them according to just or scientific laws; for although this is attainable when colour is in simple flat tints, and subordinated to geometrical groupings, when the tints are broken up and gradated into shades, and distributed with regard to flowing and naturally-dispersed forms alone, the due quantities for harmony, the juxtaposition of complementary and harmonizing tints, and true balance of parts, easy in any simple or symmetrical arrangement, becomes difficult or impossible. The present mode of ornamenting these fabrics seems to have arisen from the false spirit of imitation—a desire to rival the richness of silk; but it is overlooked that the texture, naturally light, requires lightness and elegance of form and colour; that, as a *summer* fabric, richness and fulness of hue, as tending rather to a sense of warmth, is out of place, and that, on the contrary, fresh and cool light grounds, with flat ornamental forms, either “all over” or in “up and

down" bands, or diapers of floral ornament, on a simple textural ground, are the true principles for the decoration of chintzes.

Before completing this Report on furniture, it is necessary to say a few words on muslin curtains, of which there is a large display in the Exhibition. These fabrics should, of course, have a perfectly flat treatment, whether purely ornamental forms or flowers are used for their decoration. The best effect for borders is obtained by a symmetrical arrangement of flowing lines, which may be large in pattern, from the lightness of the material; while a diaper treatment, or small sprigs arranged with large and regular spaces over the central field, are the simple rules for their decoration. It would seem hardly possible to err much in designing for a fabric which admits of such small variation, the contrast of the thick work with the more filmy ground being the source of the ornamental form, and colour being rarely used; yet, perhaps, in the whole Exhibition there are not more glaring mistakes than are made in the decoration of these goods. In the Swiss muslins, the effort seems to have been directed rather to curious skill in workmanship than to taste in design, and some of the most costly goods are in the worst conceivable taste—immense cornucopias, pouring out fruits and flowers, palm-trees, and even buildings and landscapes being used as ornament. Even when this only consists of flowers, they are used imitatively and perspectively, foldings of the leaves, and in some cases the actual relief of fruits, being attempted. Although the same faults occur in the English manufactures, these, on the whole, slightly incline to better taste, especially in some of the woven curtains from Nottingham, and in the fabrics exhibited by the UTRECHT COMPANY; but there is a sad want of good design in this class.

Except that curtains allow of an "up and down" treatment, which table-cloths do not, most of the same rules apply to damask table-linen as to white muslin curtains. The ornament of damask linen, arising, as it does, merely from the gloss obtained by various distributions of the warp and woof in weaving, ought to be extremely simple in form; yet even in these goods we find buildings, landscapes, vases, baskets, fruits in relief, and flowers perspectively treated as the details of decoration, while one designer has copied a centre-piece of precious metal, the property of H. R. H. Prince Albert, in the table-cloth upon which it is meant to be placed. These faults are present, not only in the Irish linens, but in those of France and Saxony also. There is a good design, in the German Gothic style, applied to a cloth exhibited by D. BIRRELL (Class XVI., No. 27), and some well-considered adaptations of Greek ornament in the borders of some damasks by A. H. C. WESTERMAN and SONS, of Westphalia; but the general manufacture of such goods wants serious revision. A border of flat ornament, consisting of flowing lines or flat floral treatment, carefully studied as to the distribution of quantities; a diaper geometrically arranged over the inner field, either of floral or ornamental forms, with a judicious interspace (the diaper being rather dispersed than crowded), and a central form, give the best general distribution for the surface of table-linen. Proper attention should be paid, in designing the border, to the quantity allowed for turning down over the edge of the table; and care should be taken, when heraldry and heraldic devices are introduced, that they should be strictly flat. Landscapes, solid and shaded forms, perspectives, and architectural relief ornament, should be carefully avoided. Although the principles which

govern the decoration of these fabrics appear to be simple and self-evident, there are few manufactures where a greater amount of error prevails, the nearest approach to purity of style being floral treatments, imitatively rendered.

In concluding our remarks on the design of this section, we may invite attention to the different relative importance, in an ornamental point of view, of the various articles which are comprised under the head of the furniture of an apartment. These are the work of various manufacturers, each endeavouring to give the greatest amount of decoration to his own works, without duly considering their relation to other fabrics. Thus the carpet manufacturer ornaments his articles so showily that they outvie the hangings—the wall-decorator, or paper-stainer, his goods, till they emulate the cabinet furniture—whilst the upholsterer overlays his share of the furniture with florid carving, with ormolu and inlays, or with rich broderies of silk or velvet, so as far to outshine the rare workmanship of the jeweller or the goldsmith, or the art of the bronzist, the sculptor, or the painter, with which they are mingled.

All this arises out of error; each article of furniture has a due share of importance—a relative value as decoration—beyond which it should never be forced; and the designer for each should have this truth strongly impressed on him in all his labours. We may suppose it easily conceded that the carpet, bearing the relation of the groundwork for objects, should have a quiet richness of surface and texture, intruding in the least possible degree on the eye or the observation; the wall decorations, the next in importance, being entirely of the nature of a background, should be subordinate to the cabinet work; which, in its turn, should hardly be forced into undue competition with the skilful works in glass, porcelain, metal, or the fine arts, for which it serves merely as a means of display or arrangement. Yet how often is this order entirely reversed, and the simplicity of fine art outshone by the gorgeousness of mere furniture! Where the educated taste of a decorative artist is not sought for, this too often arises from want of taste in the purchaser, who selects each object for itself, and not on full consideration of this principle of subordination; but were the designer really alive to the truth of the principle, such gaudy and false ornamentation would hardly be applied to inferior fabrics. Jewellers are careful that the setting be a proper foil to the more valuable stone, but those who have the means of richly decorating their dwellings often make such a show of the setting that it overpowers the gem.

Div. 3.—*Domestic Utensils and Objects of Personal Use.*

The third section of this Report is devoted to the examination of design applied to domestic utensils and objects of more immediate personal use. Although there is not any exact line of demarcation between such works and those more properly ranging with domestic furniture, the division is sufficiently accurate, and is convenient as permitting classification under the separate heads of

1. Porcelain and pottery.
2. Table and ornamental glass.
3. Works in the precious metals, &c.
4. Bookbinding.

It is to be remembered, however, that the Report has reference only to the deco-

rative art applied to such works, and that unornamented objects of utility are consequently not included.

It will at once be evident, that whatever is comprehended in this section ought to display the greatest purity of form and the rarest excellences of ornament, while they should be characterized by the utmost refinement and finish, since they are daily under our hands, and continually subject to minute personal inspection. Their utility, moreover, should have special attention, and convenience and usefulness be carefully studied. Here the ornamentist will have full scope for the highest efforts of his ingenuity and taste; and when working on the most precious materials, may add by his labour even to *their* value and richness.

Moreover, in those classes in which use is a first requisite, as is largely the case in china, pottery, and glass, the purest forms should be sought, allied to the greatest convenience and capaciousness; and the requisite means of lifting, holding, supporting,—of filling, emptying, and cleansing, should engage the attention of the designer, before the subject of their ornamentation is at all entered upon.

PORCELAIN AND POTTERS' WARE.

There is hardly any nation, however primitive its state, with whose works we are acquainted, that has not numbered among its manufactures some kind of potters' ware; rudely made and barbarously decorated perhaps, and imperfectly fired, but sufficient for the simple domestic purposes of people in an early stage of society and civilization.

As nations advanced in culture, their pottery improved also, both in elegance of contour, in beauty of decoration, and in manufacturing excellence; so that fictile fabrics alone will often mark the standard of national civilization, and indicate the progress of a people in the arts of life.

This has been the case not only with the Greeks and the Eastern nations, but with the modern Europeans also, both of Italy, Germany, France, and England. It is unimportant that in Europe the improvement of these manufactures has, until of late years, been dependent on the patronage and assistance of princes, since, at the period of the first impulse to excellence, this was largely the case with all works of costly production. It is sufficient to notice that the pottery faithfully reflects the taste of the time; that its improved manufacture and decoration has been coincident with general culture; and that the style and progress of art, its motive and object, are as vividly depicted on the pottery as in the pictures and statues of the age. Thus when pagan subjects began to be treated among the artists of Italy, from the revival of learning and the spread of a knowledge of the literature of Greece and Rome, this change was immediately stamped as indelibly on the pottery of Urbino as upon the pictures of Raphael and his galaxy of pupils. In the same way, when the luxurious court of Louis XV. became interested in the manufacture of porcelain, and encouraged it with royal munificence in the workshops of Sèvres, all the glare and glitter of that luxurious court, its debased art and theatrical prettiness, were at once impressed upon the works of that manufactory.

In this view of the ceramic arts there is much that is hopeful in their present position, since not only is there a manifest progress in the last few years in the general manufacture of porcelain and pottery, both at home and abroad, but a

decided improvement in their decoration. We seem to have nearly passed through the stage of mere imitation ; the antique has been carefully studied, not so much with a view to the mere reproduction of the elegant forms of its utensils and of their decoration (too much the custom during the latter end of the last and the commencement of the present century), as, from the examination of the vases and tazzas of antiquity, to obtain the geometrical bases of their construction, and the principles on which the Greeks applied ornament to their surface. Hence has resulted an improved elegance and refinement in modern porcelain ; and the beautiful details of Moresque ornament, or the richness and elegance of the Renaissance, have been adapted to its decoration on the same just principles that guided the artists of Greece and Etruria in ornamenting with their own national and significant ornaments the beautiful works which time has spared for our admiration.

The designs for porcelain or pottery are few in number and of small importance ; they are, moreover, the works of students, and in the present Report need not be adverted to. The works exhibited it will be desirable to class for consideration under two heads, generally broadly distinguishable, without, however, having special reference to peculiarities of manufacture or of material, whether as hard or soft paste, as earthenware and porcelain, since these will have proper attention in the Report of Class XXVII. They may fairly be divided into ornaments and works of utility. It has elsewhere been said that manufactures may be so over-decorated as to be degraded into mere *ornaments* ; yet when works are produced simply with that object, they may not only be admired as addressed to the purpose of giving pleasure by their beauty, but by their production they often sensibly exercise a useful influence on the general taste of the manufacture. This is nowhere more evident than in the beautiful and valuable collection of porcelain exhibited in the Sèvres Court, the products of that celebrated manufactory. There is not a more interesting department in the whole Exhibition, nor one which more fully illustrates the wisdom of a judicious application of the *best* art to manufacture. Here we find the taste of the first artists assisted by the science of able chemists, and, under a judicious direction, united to the most skilful workmanship and manufacture, and the result is that the fabrication of porcelain is carried to the highest state of excellence. The greatest part of the display, however, consists of works which must be classed as *ornaments*, such as vases, caskets, chalices, tazzas, &c. The forms adopted are pure, and those pure forms rarely interfered with by the reliefs. The details of the decoration, the modelling of the reliefs, and the painting,—whether these consist of figures, flowers, or simply of ornamental forms,—are of rare and felicitous excellence in many cases, and of high merit in all. The finished perfection of these choice works must have exercised a great influence on the other manufactures of the country, not only by forming a band of workmen educated to perceive excellence as well as to produce it, and capable of giving assistance in many other branches of manufacture, but by their effect on the general cultivation of the public taste. Nor do such establishments benefit the country that supports them alone, they diffuse taste abroad, even into other lands. Thus the improvement of our own general manufacture of china has already been adverted to, and yet it is but justice to say that it owes much to the labours of the national establishments both of Sèvres and Dresden ;

not only that their works have in some cases served as our examples, or guided our manufacturers by the principles of their decorative treatments, but from the stimulus to improvement which has resulted from the contemplation of rare works, and of that perfection which arises from a manufacture occupying itself rather upon efforts of skill than upon general production, and able to employ itself upon them irrespective of expense and regardless of cost.

Yet the danger of producing mere ornaments is fully illustrated even in china ware; more particularly in the works of the Royal Dresden Manufactory, since, as far as is shown in this Exhibition, the porcelain manufactured therein would seem never to have got beyond this result. The works have none of that purity of form which almost of necessity arises out of constructive utility; the reliefs, governed solely by the imitation of natural objects, and not by the requirements of use or the rules of art, are quite unsuited to the material; and the colour has none of that judicious subordination to the effect of the whole which is seen in many of the productions from Sèvres. The surface is often covered with purely imitative flowers in high relief, glowing and brilliant as the tints of nature, yet looking gaudy as ornament, and, from their filmy projections, liable to injury with every touch, and their preservation a source of constant anxiety to the possessor. Even the May-flower pattern,—a production of great beauty, on the principle of a diaper of form and colour,—from its minute hollows, is quite incapable of being cleansed, and from the thickness which it adds to the form, contradicts the true effect of porcelain, which should unite lightness with capacity. Imitation seems to rule, and not ornamentation. It may be, and no doubt is, difficult to form a tree with all its flowers and foliage out of porcelain, but nothing is arrived at when this is effected; it certainly has no utility, it is not ornament, and the more truly imitative it is rendered, the less it would be regarded, unless our attention was specially called to it as a wonderfully difficult effort of labour.

Altogether, a rococo air pervades the porcelain from Dresden; partly resulting from the style which was in vogue when the manufacture was at its zenith there, and largely from the production of works merely ornamental, from which it obtained so large a share of its celebrity. It still clings to the contorted constructive forms and extravagant prettiness of the style of Louis XV., which have been almost entirely laid aside in the establishment at Sèvres; antique shapes, with a more classical style of decoration, having supplied their place.

Among the most beautiful works in the Sèvres Court are the elegant tazzas, covered with moresque ornament in green and gold, and in blue and gold, on the natural white ground of the material. The two vases in unglazed bisque, decorated with figure subjects, painted by M. Roussell, after the designs of M. Amory Duval, are chaste and beautiful specimens, the colour being carefully subdued, so as to harmonize with the delicacy of the form of the vases. The Labour Vase, by M. Klagmann, sculptor, is a good example of figures in relief as ornament, so applied as not to interfere with the general lines of the form. It is a vase of large size in white bisque, very artistically designed and modelled, and is an evidence of many difficulties of manufacture, arising from its size, skilfully overcome. A casket enamelled with white figures on a blue ground, the work of M. Haman, is also an example of great beauty. When we consider the choice

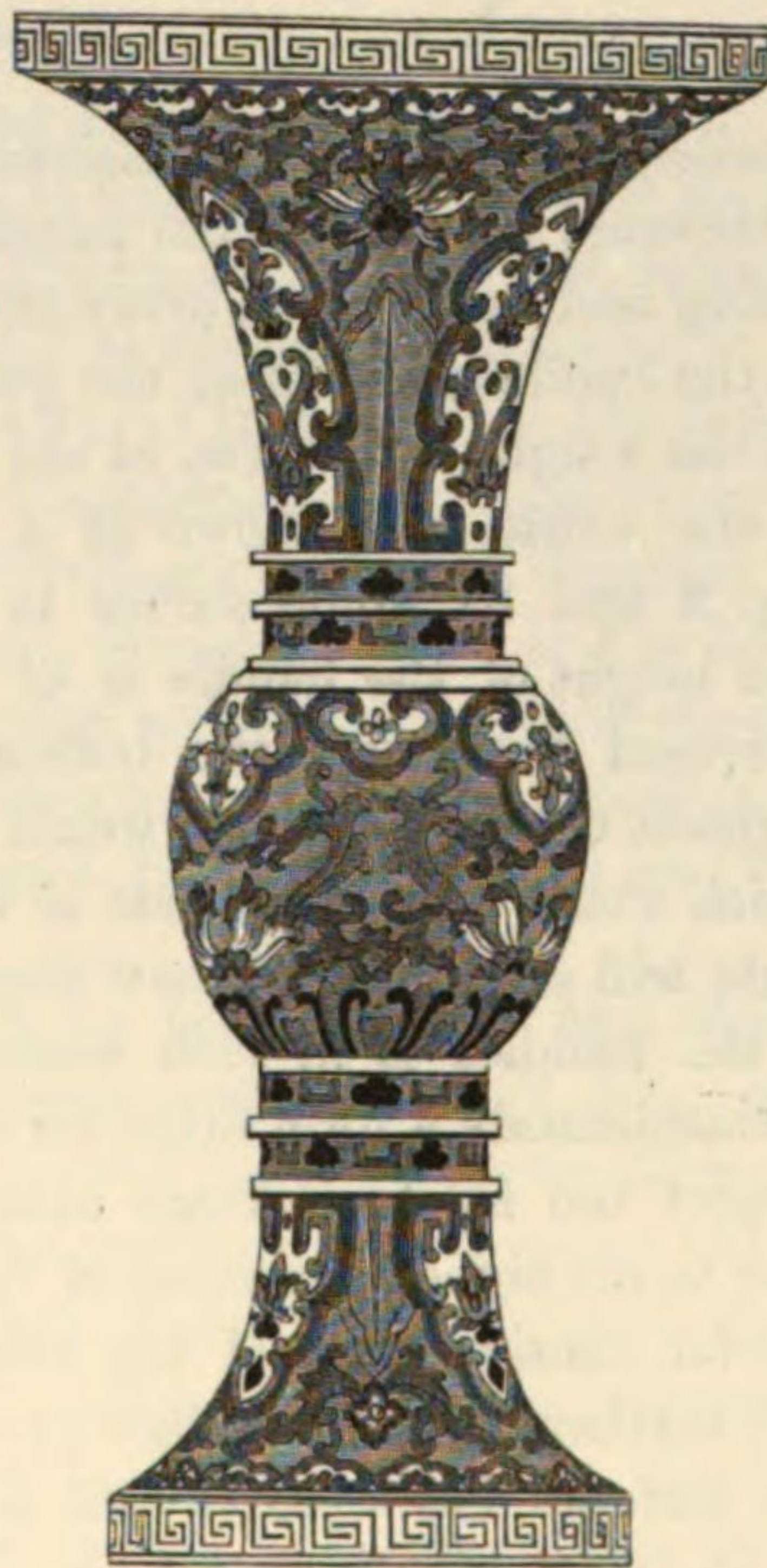
paintings on porcelain and in enamel executed at Sèvres, not only from the old masters and others, but original works also, we shall be sensible of the great impression they must produce on the workmen, and the emulous efforts of manufacturing skill they must call forth. The figure paintings of Ducluzeau, Thurgot, Beranger, Laurent, and others, with the flower-pieces of Jacobber, Schildt, &c., must be allowed to have exerted this influence in a high degree. In our own country we have skilful enamellers, as may be seen in the exhibition of such works in the Fine Art Court; but those artists are not connected with the potteries, nor employed by the manufacturers; in fact, their art is too costly for such uses, unless where, as in France, a nation pays for that which is of great value for a nation's improvement.

The skilled French artists who have been enumerated are the successors of a line of others, who for nearly a century have laboured to improve the manufacture of porcelain, aided by a band of workmen, trained in the same school, to assist them in their efforts—with what eminent success has been sufficiently shown. In England our china painters are not artists, and but few of them seem to have artists' feelings, nor until of late years have they had opportunity of gaining the necessary instruction. The painters on china copy fruit, foliage, and flowers well, but when such labours are original they too often consist of but slight variations of some stock and stereotyped forms and colours, which the workman uses over and over again, without novelty either in grouping or drawing. In the power of painting the human figure they are mostly deficient, and few of them are able to execute subjects of which flesh forms a part. The modellers also have been sadly deficient in knowledge of the figure and of its anatomical details. In both these particulars, however, they are slowly improving, and the introduction of parian and other materials for statuettes, which is beginning to form a large branch of business in the potteries, and which as yet is nearly peculiar to England, has been of service in showing them their defects and in urging them to amend them. The Schools of Design established in the potteries, in which some of the principal manufacturers take an earnest interest, have already produced some results, and, energetically supported, will no doubt be of essential value to the workman and to the manufacturer. This is abundantly evident in the statuettes exhibited by Messrs. COPELAND and Mr. MINTON, as well as many other British manufacturers. These statuettes, often reductions from the works of eminent sculptors, are completed far more successfully than would have been possible a few years ago; and when we consider the difficulty of putting them together by properly and skilfully adjusting the parts after they come forth from the moulds, and the further care required from their extreme shrinking in the firing, many of them may be regarded as highly successful results. Still there is room for improvement; the *completion*, in the details of the joints, features, and extremities, is not quite equal to some of the bisque figures that *have* been produced at Sèvres; and it is yet a desideratum (which may, however, arise from the spread of statuary porcelain) to unite in one person the artist and the workman, as in the case of the bronzists of France, as well as many of the foreign workers in the precious metals.

The royal manufactories of Berlin and Bavaria have avoided many errors prevalent in the china ware of Dresden, and have rather followed classic models.

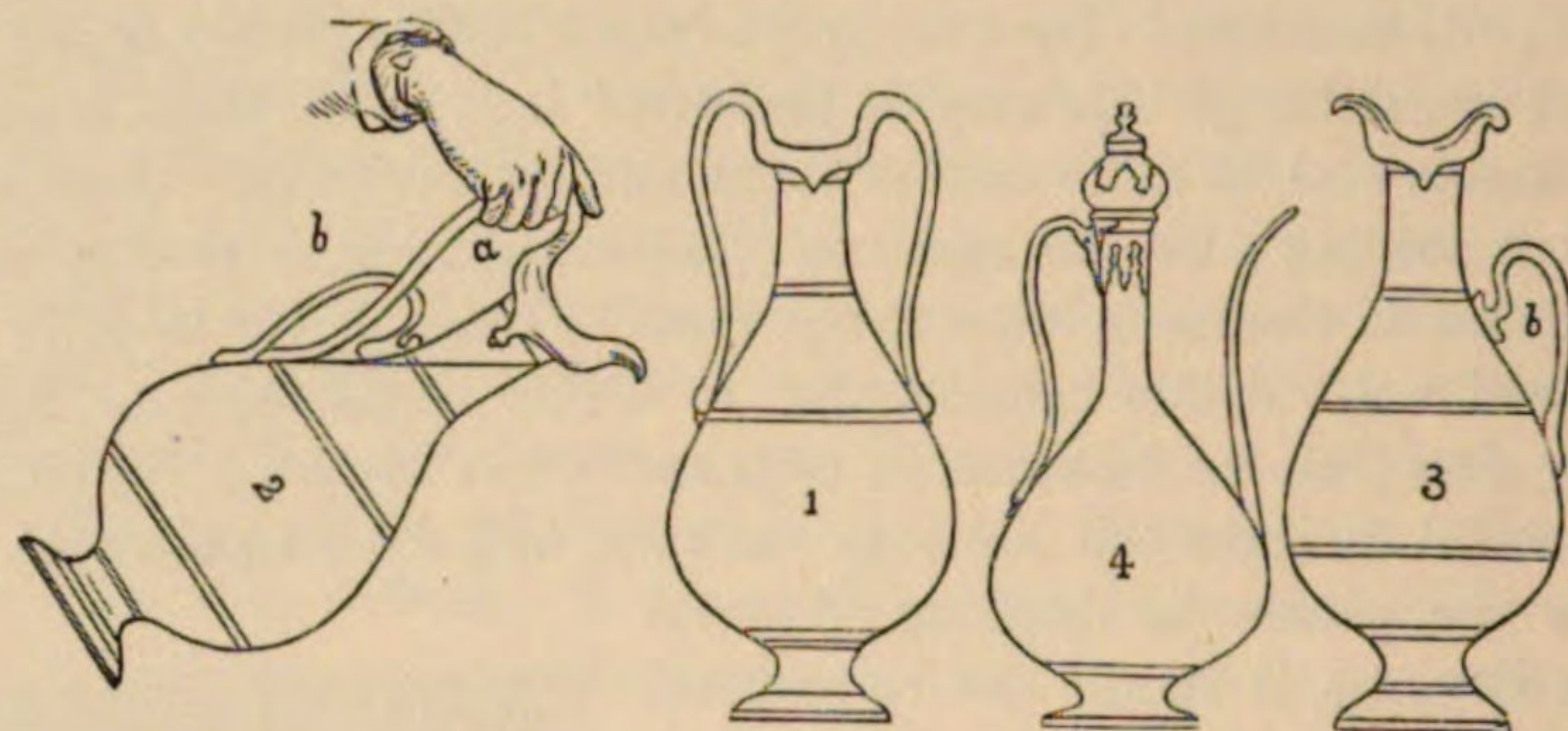
The works exhibited, however, are deficient in originality; the vases are of the most common classic forms—overloaded with ornament, and having landscapes and pictures painted in compartments on their surface. The Dresden enamel-painters on china rank next to those of France; and Bucher and Walther, in their copies of paintings by the old masters, evince a perfect knowledge of their art. Taprema, in Russia, and Nigg, in Austria, exhibit skilful enamels on china; but the porcelain from these countries has no peculiar originality or excellence to recommend it.

In considering the question of design as applied to that division of pottery and porcelain which more especially comprises works of utility, constructive form should have the first attention; and in such works as are intended for vessels of capacity those forms should be adopted which, while they are most elegant, are best fitted for containing or holding. Such articles, moreover, being of continuous use, the power of ready cleansing is of great importance, and should have due attention from the designer. It is to be remembered, also, that the means of receiving that which is to be contained is as necessary as its ready outpouring; since it is hardly desirable to have to apply a funnel to fill a pitcher or jug intended for constant use, although this may be permitted in a bottle which is required to keep its contents cool, or to be carried about, and subject to spill them by jolting, and therefore needing a smaller aperture. Moreover, a jug, or pitcher, which will admit the hand to cleanse it thoroughly, must be more suited to daily use than one which will not. A due consideration of utility would regulate the form in many other cases; as, for instance, in cups and other drinking vessels it might be most graceful to curve the top edge outward, but, since such a form is likely to overflow the person in drinking, however superior in elegance, it should not be adopted. When utility is considered before ornament, numerous truths of the like kind will be arrived at, which are entirely overlooked when the order is reversed; thus relief, when used, should be extremely low, and without indented hollows in the composition, as well as without undercuttings, in order to give facility for cleansing; but, while this is required for utility it is necessary for elegance and beauty also: the Greeks were fully aware of it as an important truth, and in their pottery abstained from reliefs, or kept them to the lowest impost: the vases of Etruria have generally their line unbroken by the ornament, and the reliefs on the celebrated Portland vase are so extremely low as entirely to preserve its outline. In the same spirit our great Flaxman worked to improve this fabric, as may be seen in the examples exhibited by Messrs. Wedgwood; the style being still a tradition in their works. The eastern nations are sensible of the same truth, and their decoration



of pottery is on this principle, being entirely subservient to the lines of the form. The antique Chinese vase for cut flowers, exhibited by Mr. ALCOCK, and engraved on the margin (p. 1645), will illustrate this, as well as the fitness of form to use. The neck narrow at the bottom, whereby the stalks would be compressed and supported; the enlarged bulb, to contain sufficient water for their nourishment, and at the same time to serve as a boss for the hand to grasp, is of a piece with the proper consideration of the decoration. This is not painted, but is of the nature of an inlay, being *cloisonné* enamelled over the whole surface; that is, the enamel colours are filled into a coffer of metal standing on edge around the ornamental forms, the line of the vase being carefully preserved.

The application of handles is another important point connected with constructive design. The easiest and most convenient means of lifting the weight, when lifting only is required, and of lifting and pouring when both are requisite, being the question to be determined. Too often this is arrived at more by chance than by calculation. We see, for instance, the form of an Etruscan vase, such as is shown in figure 1, adopted as a pitcher; the original having two



handles, formed for its occasional removal only; for its new purpose, a spout is substituted for one of the handles; perhaps it is to serve as a ewer, requiring raising and reversing at every effort to pour, and yet, so changed, it is acted upon by the hand and wrist at the greatest possible disadvantage, the hand having to lift the weight, as it were, at the end of a long lever, and reverse it by the power of the wrists, as is shown at *a* (fig. 2), while a much less power applied at *b* (fig. 2 and 3) would suffice to reverse the pitcher and pour forth the fluid. The height of the handle is of less importance when the contents have to be delivered from near the bottom, as in the eastern form at fig. 4; since the slightest tilt of the vessel would begin to empty the contents through the spout, which would not be the case if they had to be discharged from the top. These hints will serve to show how important the proper consideration of the insertion of the handles is in such works, and how errors arise from merely adopting inconsiderately a form fitted for one use for another purpose. It would carry the subject too far to increase examples, but these suggestions followed out would lead to multiplied instances of false adaptation, and may serve to induce a more careful consideration of the subject. In the application of colour to porcelain and earthenware, the surface never should be wholly, or, indeed, largely covered; the material has a purity that should be decorated, not obscured. A due consideration of this simple rule would condemn a vast amount of bad taste, such as

completely metallizing the surface of china by gilding, changing china into imitative marble, or covering the field of many utensils with pictures, landscapes, or flowers. The Greeks decorated their pottery in bands, introduced to mark the change of curve, or to separate the various surfaces: the eastern pottery is in the same way decorated in bands, or, where the surface is more covered, it is merely with a diaper, which leaves the material sufficiently visible.

Landscapes and pictures are almost always out of place in pottery, and it certainly is objectionable to cover the centres of plates and dishes with pictures and views; not only because it hides the surface, which it has been before said it is desirable to retain, but because utility would be better served by the absence of any decoration in the part which receives the viands, to satisfy that sense of cleanliness only to be obtained by the white unchanged surface of the material.

There is still another subject to be referred to, which consists in the imitation of the ornament peculiar to one age and one purpose on the utensils of another age, and which are intended for totally different uses; or applying the ornament of one material to the decoration of another, which last fault, in speaking of other manufactures, has already been often strongly animadverted upon. The revivals of Wedgwood were, in a degree, in this spirit; and although they produced a vast change for the better in the forms of our pottery, and placed a salutary curb on the extravagance of the style that then obtained, they were but the resurrection of a dead art; and the funeral urns of Etruria, being inconsistent with modern uses, have a cold formality quite inconsonant with the feelings of the time. An attempted manufacture of these vases, decorated with the beautiful outlines of Flaxman, of which a large number are exhibited by another house, can have only partial favour, as they can serve no other purpose than as ornaments, and will never enlist the sympathies of the general public in their favour.

The abuse of the ornament of other materials to unsuitable purposes is shown in many ways in this fabric; among others, in copying engravings and pictures on to various utensils. In one case the most sacred symbols of religion serve as decoration for the borders of plates, while the centres of them, and of the dishes of the same set, consist of angels, copied from an illustrated prayer-book, flying in the midst of a blue heaven diapered with stars. Such incongruities, improper in any case, are sadly and strangely inapplicable to a dinner-service. It has been well said, that "symbolical ornament demands perfect accordance between the use of an object and its decoration;" but can anything be more inharmonious than such sacred symbols mixed up with a festive dinner? Such incongruities are ever arising from unthinking imitation.

When, however, due allowance has been made for faults, failures, and shortcomings, it is impossible not to feel that the general manufacture of china has made great progress in this country. There is a greater selection of pure forms—a less gaudy treatment of the whole surface—than heretofore; and where works are founded on past styles, their most meritorious qualities are selected, their faults rather avoided, whilst the power of the art-workman has visibly increased. Thus, in the beautiful dessert-service from the manufactory of Mr. Minton, whilst there is much that is derived from old Sèvres patterns, it has been by judicious adoption, rather than imitation. If the figures are a little crowded, they will be found exceedingly well modelled; and the purity of their white

material, contrasted with the delicate hues of the colours combined with it, has a chaste effect, the furthest possible removed from gaudiness. Indeed, the great merit of the works from this manufactory is the restrained use of colour, and the general delicacy of the decoration. Some of the small figures on the centres of the plates are excellent specimens of the china-painter's art, and there is almost a total abstinence from landscape, or mere pictorial subjects, on these utensils. As to the imitative renderings of flowers on china, it is hard in this case to object to their want of conformity to principle, since the beauty and purity of the surface of china is so suitable to such art, that here, if anywhere, their use may be overlooked. The porcelain both of Messrs. Copeland and Messrs. Rose holds a high place also for form and colour; and some of the most successful of the larger efforts at enamel-painting on china in England are exhibited by the artists in the employ of these manufacturers, as well as some excellently-finished statuettes. The application of porcelain to decorate the jambs of fire-grates has produced some well-designed slabs from both Messrs. Copeland and Messrs. Minton; although, perhaps, one of the best designed of such works, with certainly some of the best English flesh painting, is to be found in some jambs attached to a grate exhibited by Messrs. Stuart and Smith. An application of the design of some jewelled embroidery from the work of Mr. C. J. Richardson, to ornament a flask, exhibited by Messrs. Copeland, gives a rich treatment, although contrary to the sound principle of not covering up the surface of the material too entirely; but in another specimen exhibited, the whole merit of the adoption has been lost by introducing a landscape amid the lines of the form, making it appear how much chance, and how little principle, has governed the choice. One or two plates in Mr. Copeland's collection have great merit in their design, the width of the ornamental margin being well considered and the centres judiciously plain.

The general manufacture of pottery in France includes some artistic adaptations of design to brown stone-ware, and of colour to its surface. The collection is exhibited by M. Mansard (France, No. 1342). Although belonging too entirely to the class of *ornaments*, and objectionable from the false relief sometimes adopted, the application of art of a superior kind to common materials deserves much praise, and is worthy of attention, as showing how much might be done by a like attention to the manufactures of such wares at Lambeth and Fulham. Of the Palissy ware exhibited, little can be said in this Report; for although evincing much skill, it is so entirely opposed to all utility, and even beauty, and so completely a work of mere curiosity, that the difficulties overcome do not redeem it. The true Palissy ware did not consist of such unmeaning reliefs as are here applied to plates and dishes. The porcelain exhibited by M. Lahoche (France, No. 1287) contains some plates of meritorious design, as well as one or two elegant tazzas. In Bavaria some plates, designed by Kaulbach, are very judicious in the treatment of their ornamental borders; although the pictures from Reynard the Fox, painted on their centres, must be objected to. Some jugs, designed in the old German style, are pleasing from their varied surface.

GLASS.

Among the many beautiful materials which the earth has yielded to the industry of man, to add to his comforts and increase his enjoyments, glass holds a prominent place. If we regard its use in the fabrication of utensils to contain the fluid portions of our food, it is most especially valuable, since its surface has the power of resisting the action of almost all liquids, and, as a material, it unites strength with extreme lightness and great capacity. Its perfect transparency is another rare quality, whereby the purity and clearness of the liquid it may serve to contain is immediately manifest, enabling the satisfied eye to minister indirectly to the pleasures of taste. Moreover, whilst it is one of the most cleanly materials, from its extreme smoothness and hardness of surface, it is also most easily purified, and its pristine brilliancy is restored by the smallest possible effort of labour. Besides all these varied qualities, the materials of which it is composed are of the least costly kind, and the processes of its manufacture extremely simple; so that it is fitted for general use, and within the means even of the poorest purchasers.

For the purposes and utensils above enumerated, the qualities ascribed to it, properly understood and duly considered, will lead to a discovery of the principles which should govern its design and decoration. Of these, the foremost are its brilliancy of surface and its transparency, both of which should ever be preserved with the greatest care in all right treatments of glass. And yet, strange to say, these qualities are not only often disregarded, but there is a strong tendency to contradict and destroy them: thus we see wine-glasses and decanters, water-bottles, caraffes, and drinking-vessels of many kinds, not only with the surface covered with ground ornament, but sometimes wholly and entirely changed and obscured by grinding, so as to render them perfectly opaque: or, we have colour most injuriously applied to destroy purity, and prevent a proper enjoyment of the glowing lustre of the liquid contents; whilst sometimes the material is wholly or partially opalized; in the one case making it into a spurious porcelain, in the other into a species of japanned hardware, without the toughness and tenacity of that manufacture. Another excellence of glass is its lightness, as compared with its power of containing: the maintenance of this quality is opposed to the heavy and deep surface-cutting to which glass is now so frequently submitted, especially in water-jugs and decanters, and in the pieces of dessert-services. This cutting is intended to enhance the jewel-like and prismatic effect of glass, but it is opposed to its true qualities for such purposes, and should only be resorted to in handles, stems, or bases, where transparency is unimportant, where constructive thickness is necessary, and the grasp in holding may be aided by the facets of the surface. Yet it has been the fashion to carry this practice of cutting to an extreme, tending to vulgarize, as far as possible, the simple and beautiful material: in some of the works exhibited it has been applied even to the bowls of wine-glasses.

The more simple mode of manufacturing glass is productive not only of the most beautiful shapes, but of its best qualities: and blown glass unites thinness, translucency, and pure surface, to forms which combine the greatest symmetry with varied curves; that is, the sphere, resulting from the circular motion of the

workman's instrument, elongated by the breath and weight, into the ellipse and its combinations. These blown forms may be ornamented by narrow bands of engraved ornament, of which flatness and symmetrical distribution are requisite qualities: in wine-glasses and drinking vessels it ought to be reserved for those parts of the bowl which do not interfere with a perfect sight of their contents. Any gilding or enamelling can only be admissible under the same rules. In all cases, elegance of form should be the first consideration, to which cutting, gilding, or engraving should be entirely subordinate. The relation of the stem to the bowl in wine-glasses is another point of some importance. The practice has of late obtained of making them of such extreme tenuity as to produce a sense of fragility and insecurity, which is quite as great an error in taste as the contrary fault of heaviness and thickness.

Like porcelain, a section of the manufacture of glass is devoted to the production of what can scarcely be called by any other name than *ornaments*. But while the production of porcelain ornaments has been fostered by princes, and, through the clever artists attached to royal manufactories, has arrived at great beauty and rare excellence, reflecting back an improved taste on the design and decoration of the general manufacture, glass has not been favoured with such advantages; and the specimens of Bohemian and Hungarian glass in various parts of the Exhibition, notwithstanding the rare beauty of the materials of the manufacture, can hardly be instanced for the merit of their design. The mode of manufacture, by casting in clumsy masses in wood or metal moulds, and reducing by cutting with the wheel, is contrary to the best qualities of glass, which consist of lightness and elegance. This alone causes many of the faults of the manufacture; since the true characteristics of glass are lost, and are replaced by qualities too apt to degenerate into the meretricious and the gaudy. Thus transparency is merged in rich colour, and this, again, overlaid with gilding: or the surface is flashed with opal, cut away by grinding to the coloured under-surface; sometimes giving the appearance of porcelain, sometimes even that of the inferior manufacture, papier maché; whilst, occasionally, the whole surface is frosted by grinding, and tinted in crude colours, the appearance of glass being entirely lost, and only its worst quality, that of brittleness, remaining: whilst the forms adopted are often as inelegant and rude as they are unsuited to the material to which they are applied. The tall chandeliers exhibited among Count Harrach's glass are examples of these remarks; at first sight they resemble papier maché, from the excess of gilding on the dark ruby glass; and when examination determines them to be glass, the deeply-indented horizontal throatings of the mouldings of the shafts give a sense of dangerous insecurity and ill-adapted construction. This is far less seen in the smaller works of the same kind, but it is, nevertheless, the natural result of a wrong application of constructive forms to the material, and of an improper over-decoration of the surface: whilst it would appear that the true adaptation of such glass for the above purposes has not yet been obtained, its use in the manufacture of lamp pillars, knobs, and handles, lock furniture, and finger plates, has been more successful, and seems likely to be attended with more tasteful results.

When glass is used for large objects, such as chandeliers and candelabra, where construction is required, its known brittleness is rather at variance with

the constructive application of the material, and it seems in the principal branches and supports to require not only a hidden metallic structure, but even the appearance of it to the eye, to overcome a certain sense of insecurity.

In upright standing candelabra the work should arise out of some other material as a base, and it is exceedingly objectionable to base a glass superstructure on the same material, supported on foliated or other forms of the nature of feet. In hanging chandeliers a construction entirely of glass equally quarrels with the sense of security; the chandeliers of the last century illustrate the error of such constructions,—their long bent branches appear weak and brittle, and the full beauty of the glass is not brought out by the lighting; the present mode, which treats glass rather as a string of jewels assisting to hang up the branches, is more consistent with its true use and best qualities; for while in masses it constructs ill and has not its full brilliancy, lustre and prismatic beauty are obtained by loose pendant forms cut with proper facets, so that every motion, however slight, contributes to the splendour of the work by the varied reflections of the lights. In such works coloured glass should be introduced sparingly, and it should always be translucent, opalized coloured glass hardly ever having a judicious effect.

In referring to the exhibited works in the manufactured material, the first place is due to the glass fountain of Messrs. Osler. It is a matter of regret that a production so unique in this material should not be entitled to praise for its design; the truth is, that works of the like magnitude in glass never having been before attempted, and the designer being consequently thrown on his own resources, he should have seized the opportunity so offered, and, striving to forget what had been done in other departments, treated the material for itself alone, and consistently with its own proper requirements. Instead of this there is an attempt to mix architectural stone forms with others that have become almost conventional in glass, and the result is inconsistent and unsatisfactory. The glass pillars are far too slight for the heavy inverted canopy, and both those canopies are too large for the basins above, very inharmonious in their contrast of lines, and unfitted for the agreeable display of the water; the glitter of the jewel-formed ornaments with which they are covered being confused with the motion over them of the natural element, instead of serving to show out its brilliancy and clearness; indeed it is evident that the main source of error has been in supposing glass, and especially cut glass, a suitable material for a fountain; it is at once seen that this is not the case; instead of its being a proper foil for the sparkling water, glass emulates its sparkle and lustre, and the result is a failure from want of contrast.

The unsuitableness of glass, when on a large scale, for self-construction is also seen in this work, and is partly felt in the large and otherwise elegant candelabra exhibited by Messrs. Osler, the property of Her Majesty, especially in the horizontal indentations of the architectural moulding of the bases, which induce a sense of liability to break arising from the known brittleness of the material, as has been before alluded to in the works from Bohemia; in other respects they are in good proportion and beautiful in material, and the gilt bases on which they stand supply the want of a metal foundation before remarked on; the colourless quality of the glass is extremely beautiful. It is hardly possible

to estimate properly the effect of cut glass except under the influence of the light for which it is adapted, an influence which has been noticed even in the case of metal chandeliers, and which would be much more marked in its effects on the prismatic forms of glass; but loose pendant pieces attached together in long sweeping lines are well adapted for this purpose; and the general forms of such works as exhibited by Messrs. Osler, Messrs. Apsley Pellatt and Co., by Perry and Co., and others, are good, although they do not satisfy the mind as to construction, and sometimes appear to want simplicity. It has been necessary to diverge a little from the classification at the head of this section to take notice of the above works and others of the like character; in returning to the objects more especially included in this part of the Report, the table glass exhibited by Mr. J. G. Green (Class XXIV., No. 32) deserves especial notice, both from the general excellence of the forms, and from his large adherence to those principles which have been considered as best regulating the true use of this beautiful material. In his blown glass jugs, water-bottles, and wine-glasses, some of the purest forms derived from Greek utensils have been selected and adapted to the material and to present use; they are decorated with ground ornamental forms in bands, and, although the ornament is sometimes too redundant and dispersed, it is in the right direction. Many of the forms exhibited by Messrs. Pellatt, and by Messrs. Richardson of Stourbridge, have great merit, while the beautiful application of glass to door-handles, and the extreme purity of the material obtained by Messrs. Pellatt, of itself gives it a high ornamental character in such works. Messrs. R. Harris and Sons have some finger-plates in glass that point out a beautiful use of the material; one with a diaper in silver on a blue ground is chaste in effect and clever in its design. P. J. Lahocche, of Paris, exhibits some goblets and glasses of pure blown forms, simply ornamented and in good taste; but on the whole the best white glass, both in form and ornamentation, is to be found on the English side.

The design of the Bohemian glass, both of Count Harrach, the largest exhibitor, as well as of Messrs. Kolb, of Prague, and of other manufacturers, Foreign and English, is tending rather to injure than improve public taste from over decoration. The richness of the material, from the brilliant colours that may be produced in it, renders it liable to this fault, which is greatly increased by the gaudy extreme to which the ornamentation is carried, too often applied to coarse, unrefined, and inelegant forms.

WORKS IN THE PRECIOUS METALS.

The design and ornamentation of works wrought in the precious metals deserve especial attention in this Report, since in this department we may expect to find the highest *art* applied to the richest and most costly materials. Moreover, in such manufactures more than in any other the labours of the artist and the ornamentist seem to concur, and are often so intermixed that it is difficult to designate their several provinces, or to determine where art and ornament diverge from one another. Here we have a field wherein we may study the right application of each, and understand the due limit within which each is available for the purposes of manufacture.

However, in the highest range of his art, the ornamentist may be merged in the

artist, there is a distinct difference in the principles of the two arts, a difference which becomes more apparent as the ornamentist descends from labours of such high requirement to those more strictly within his own province. Art has its childhood in a careful imitation of nature, and grows into an abstract imitation or generalization of nature's highest beauties and rarest excellences—still, however, imitatively rendered—and nature, thus selected, becomes the vehicle for impressing men with the thoughts, the passions, and the feelings which fill the imaginative mind of the artist. The generalized imitation of nature is the language in which these imaginative abstractions are embodied and expressed, and this whether the artist be sculptor or painter; the landscape painter even proceeds on the same principles, and endeavours by a selected *imitation* to reproduce the aspects of nature in harmony with certain feelings which fill his mind, and which he wishes to impress on the mind of others. In its lower phases art relies more and more on imitation, seeking to give pleasure only by the reproduction of beautiful objects or beautiful combinations, until, in its lowest development, art, if it can be so called, rests contented with mere *imitation*.

In considering in a like manner the scope of the *ornamentist*, it will be evident that in his highest aims he is assimilated to the *artist*, so that it becomes extremely difficult, nay impossible, to separate them, or draw any line of distinction between the one and the other. Thus the beautiful shield which embodies the description given by Homer of that of Achilles, designed by Flaxman, and exhibited in electrotpe in the Fine Arts Court, and that skilful specimen of embossed work, the shield by Antoine Vechte, in the collection of Messrs. Hunt and Roskell (Class XXI., No. 97), are at one and the same time works of art and works of ornament. From this high range the occupation of the ornamentist descends by imperceptible degrees; not as in the case of the artist through the more and more close *imitation* of nature, but by selecting from her whatever is beautiful and graceful, irrespective of her individual embodiment of these qualities, and adapting them to give pleasure separately and apart even from any wish to recal the objects themselves from which he has sought or obtained them; his effort is to give the most characteristic embodiment of those natural objects (viewed in relation to some peculiar quality, form, or colour, or some particular adaptation required), rather than to imitate; indeed he departs more and more from *imitation* as he diverges from the path of the artist to occupy his own separate province as an ornamentist. These are truths to be continually borne in mind, as they constitute the only cure for that false style of ornament so largely pervading the manufactures of the day, and already so frequently alluded to under the name of *naturalism*, consisting of the mere *imitative* rendering of natural forms as ornament, and which is nowhere more largely exhibited than in works in the precious metals, and in the affiliated manufacture of plated and Sheffield wares.

While it is not possible, therefore, in works in the precious metals, entirely to separate the artist from the ornamentist, still for the purposes of description their separation is marked with sufficient distinctness. A great cause of the faults exhibited in these works seems to be, that they have received their design rather from the artist than the ornamentist; thus we have figures having no constructive connexion with the work ornamented, but rather of the nature of statuettes perched wherever a ledge or shelf offers accommodation for them: these are

generally as *imitatively* treated as the material used and the powers of the artist permit, and are applied to inkstands, candelabra, and works of the like kind requiring a purely *ornamental* consideration. Many centre-pieces, racing-cups, and testimonials are treated merely as groups would be by the sculptor, although the lowest style of his art has but too frequently been adopted, and imitations of textures, chain and plate mail, and such laborious littlenesses, made a point of, rather than that nobler view of art, which, discarding miniature and strictly imitative details, seeks by grandeur of form and largeness of manner to make us forget the scale of the work in the dignified style of its treatment. Now, if it is proper that these works should be consigned to the hands of the artist, he is bound to treat them according to the laws of his own art, not only by a noble style but also by making them as groups truly statuesque, combining the parts so that they form an agreeable whole in all possible directions of view. Above all, the *thoughts* which, as works of *art*, they serve to embody, should be such as are worthy of being illustrated on metals of great value, which enriched by true art are enhanced in worth a hundredfold.

If we contemplate some of the inventions of the artists, and some of the thoughts which they have wrought out, we shall be indeed surprised that such puerilities could be dwelt on long enough to execute them as works of art, and still more that manufacturers, so shrewd as they generally are, should be found to engage in their production, were it not sufficiently evident that there is a large and wealthy public whose taste does not rise above such *art*, proved by its becoming patrons and purchasers. What can justify the employment of the precious metals, and what ought to be the more precious labours of artists, upon huntsmen and ploughboys, to render them with all the coarseness of their garments and the texture of their hose? or who, but the givers of a testimonial, relying on the known taste of its receiver, would require art to be degraded into the mere imitation of a hedge-row occurrence on a hunting-day when the sport was successful; knee-breeches and top-boots being as important items in the groups as the hounds, horses, and the portraits of the individuals whose goodfellowship it commemorates? It is such art in the more precious metals, employed on such thoughts, that leads, in the imitative manufactures, to the many paltry inventions which are found to prevail therein. Rachel at a well in a rock under an imitative palm-tree draws—not water, but ink: Burns' shepherdess would find the same black fluid in the formless well by her side; a grotto of oyster-shells with children beside it contains, not a light, but an ink-vessel; the milk-pail on a maiden's head contains, not goat's milk, as the animal by her side would lead you to suppose, but a taper. Such works are akin to épergnes with the hippopotamus and his keeper; or Paul and Virginia under a palm-tree that upholds the glass for flowers on its top; or Apollo dancing, supporting at the same time a glass épergne twice his own size; and inventions of equal or greater *novelty* wrought out with great waste of skill and labour. Even when we arrive at really artistic works in this style, of which happily there are many, it is more than doubtful whether the ornamentist would not be more suitably employed upon them, and an ornamental and architectural construction first obtained, ere art was called in to aid in their completion. It is not pleasant to add, that the above strictures more especially refer to English productions. It is true that such works have

often a local significance or an individual importance, causing their exhibition here, and making it less likely such should be exhibited by the foreigner than plate of a specific use, or ornamental works whose characteristics are more general ; but it is impossible to deny that the taste of the class who purchase or commission these works abroad must be higher than our own.

In France, for instance, we find testimonials and prizes taking the shape of art rather than of massive metal. The President of the Republic, in contributing a prize to the winner of the Chantilly races, presents a shield, on which are four reliefs, illustrating racing in various ages of the world ; and when the *workmen* of Montlucon and the inhabitants of Lot desire severally to present testimonials to Generals Changarnier and Cavaignac, the weight of silver is of far less importance in their eyes than the rare beauty of the art-workmanship. These works are exhibited by M. Froment Meurice ; and the two latter, two beautiful swords, are choice examples of design and chasing. Moreover, it is worthy of notice that in such works the artist does not consider his vocation a separate one, but regards the utility while he perfects the art. In both the above sword-hilts, the ornament (groups of figures) has been so thoroughly adapted and composed for its purpose as a handle, that it is perfectly accommodated to the grasp ; which is the case also with a beautiful short sword, ornamented with the history of St. Hubert, executed by M. Marcet, and exhibited by Marrel Brothers (France, No. 331) in the same department.

When the amount of those works exhibited by the gold and silver smiths of Great Britain is regarded, an amount whose value is to be estimated by its weight in *tons*, it must be owned that there seems ample encouragement for more skilled labour ; but the slightest glance will serve to show how largely the mere weight of metal enters into the estimate of value by the possessors of plate here ; and, on the contrary, how little fine art is considered to add to its worth. And yet art would give a more real and permanent value than mere material, and tend at the same time to separate the precious metals from the plated substitutes which ape their richness, but which would never engage the hand of the artist in such rare and costly efforts of skill ; indeed, it is a curious fact, observable in the imitative manufactures, more especially in those where the production is very easy, and the sale likely to be extended from the cheapness this induces, that, instead of being employed on art, of the best character, in the first type, it is often of the most wretched description, notwithstanding one might suppose that the cost of the first model, even if high in itself, would be trifling dispersed over a multitude of copies ; but it is probable that the style of the work in such cases is suitable to the general taste of the purchaser. Thus the electrotype process, by which means the rarest specimens of art can be, and have been, reproduced, applied to general manufacture, or where original works have been attempted, has been too often used on the worst art and the most puerile ornament. The same is observable in works formed by stamping in dies, and even, though in a less degree, in those cast in moulds, and afterwards chased ; and it is only when the same man's mind invents the work that his hand executes, that the highest skill is seen conjoined with the most beautiful art.

It must be owned, however, that our countrymen are greatly deficient in the treatment of the precious metals as the medium of art. The truth seems to be

that here one artist designs the work, and perhaps makes the model, whilst another is employed to produce it in the metal. Thus we find works designed with great ability, and modelled with much knowledge, and evidently by artists of great professional excellence, yet these works are completed in the metal with every possible littleness of imitation, serving only to degrade and vulgarise the art it is employed upon; and this frequently is caused by the surface treatment and the mode of execution, wherein imitation has taken the place of art. Thus the true artist does not produce the texture of the fur of animals hair by hair, but gives its general expression by some conventional rendering, by the indications at the parts where the skin folds, or by tooling to emulate the lustre of its gloss. In the same way true art does not imitate the materials of our dress by the threads of its manufacture, but indicates them rather by the shape and contour of the foldings. Yet in the works under examination the surface is often subjected by the workman to a most laboured treatment, labour without knowledge, which dwells more upon hairs and threads, upon details and buttons, than on the form of a joint, or the bones of an extremity: the one is a labour that requires no exercise of thought, nothing but mere dexterity; the other requires a workman not only educated into a knowledge of the parts, but who can enter into the feeling and intentions of the designer. This dwelling with complacency on mere labour, and evident satisfaction with its tedious felicities, can only arise from the habit of giving the models of the superior artist into less skilful hands, to be completed in metal.

Again, in the higher works in silver the foreign artist has had the boldness to regard the material, rich and costly as it is, merely as the vehicle of the art he adds to it; and that lustre and brilliancy, which is one of the great excellences of the rarer metals, he subdues by acids to prevent the glare from interfering with the forms of art. To the eye, silver, so treated, might be so much zinc, did not the informing mind and the beautiful art enshrined in it at once bespeak the valuable metal which alone is capable of rendering such a noble return to the artist's labours. The metal so used serves only to display the art; but our workers in the precious metals have not yet arrived at such a state of virtue; the value of the mere silver is too great in the eyes of the public to be given up, and the full glitter of its polish must be sought to satisfy their feeling of cost and magnificence. From the same cause it is, no doubt, that figures, well designed and artistically modelled, are loaded with toolings and burnishings, are matted and frosted, and every other expedient attempted, to show the silver rather than to exhibit the art.

Another defect of the works in the precious metals, as exhibited on the English side, may be traced to the same cause—the separation of the work of the artist and the silver workman: hence casting and chasing are the means of production here, whilst the foreign artist himself uses the hammer and the punch, and beats out with his own hand the creations of his fancy or the inventions of his skill. Casting and chasing in their proper application are means only of producing and perfecting a thing, after the design and model have been executed: even in the hands of the artist himself they are but completing and perfecting processes; the work, as far as invention goes, is already done before it is committed to the mould; and the chaser does but perfect what the caster has produced, with the

more or less excellence, according to the art-knowledge which he possesses; but by the embossing process, called *repoussé*, the artist himself produces the work by punching the plate of silver on a soft matrix, and continually annealing it in the course of his labours. By this embossing process the mind of the artist is working with every stroke of the craftsman's hammer; and not only does his own hand work out every characteristic quality of the surface, whether of flesh or of drapery, and his knowledge supply every essential detail, but thoughts seem to arise out of the very method and means of working, and each stroke on the punch may prove a suggestion leading to new fancies, or be followed out into more happy details. Even from the accidents of annealing—constantly necessary during the work—the colouring of the metal in the furnace calls up new thoughts, like those which arise in the mind of the poet watching the glowing embers, and the artist at once embodies his new-found fancies. Chasing has none of these suggestions; as before said, it only perfects: whilst embossing is to it what etching in the hands of the painter is to engraving. The very means in the one are suggestive in every stage of the progress; while the other is only a more or less complete copy of a previously designed original. The beautiful and skilful works of Antoine Vechte, both the shield before alluded to and the vase representing the story of the Titans which accompanies it, with the beautiful centrepiece wrought in silver partly by the same process, the work of Wagner, exhibited at the entrance of the Court of the Zollverein, are rare specimens of this mode of working, and its suggestiveness will be at once understood by those who are at the pains to examine them, since they all three have parts only partially finished, such parts remaining as it were in the state of sketches, and speaking in this state so strongly to the inventive fancy of the artist, that he who looks into them feels a strong desire to work out the thoughts and fancies they cause to crowd upon him. The iron shields exhibited by Le Page Moutier are also fine examples. This mode of workmanship tends also to a unity between the ornaments and the objects ornamented, whilst chased work and cast figures, too often necessarily wrought apart, and applied to the group or thing ornamented, have oftentimes a contrary tendency. In reviewing the question of works in the precious metals, there seems a coarseness and florid style pervading English works, showing itself in groups “in the round” in imitative art, in bold and overcharged relief, in coarse ornamentation, and in enlarged scale; whilst in France, the only other large exhibitor, and in the works of Wagner in Germany, and of certain French artists on the English side, there is much less of this grandiose coarseness, particularly in art not specially devoted to purposes of manufacture. At the same time they have, perhaps, in some cases rather too much ignored the consideration of the material, and treated it entirely as a medium for the art. This was not the case with the mediæval goldsmiths, or with those of the 16th century, who, whilst adding exquisite art to rich materials, so treated the general surface as to obtain at the same time the richness and lustre of the precious metals. One thing that we neglect, however, which our French neighbours do not, is the use of enamels; and the varied treatments of surface by oxidizing, parcels-gilding, burnishing, niello, &c.

The use of enamelling as an ornamental addition to the surface of the precious metals has been confined, with one or two exceptions, to chalices, patens, reli-

quaries, and other ecclesiastical goldsmiths' work, founded on ancient and mediæval examples; and there are some good specimens of Champleve enamelling in the collection sent by Mr. Hardman, as well as in the works of Keith and Skidmore, and in France in those exhibited by M. Poussielgue-Rusand; but the most artistic examples of the use of enamelling are in the elegant mountings of rock crystal, agate, and lapis-lazuli, as cups and flagons, by Mr. Morel, of Burlington-street, which, for felicitous design and beauty of execution, equal the rare examples of the 16th century. It is understood, however, that these are the works of a French artist. Mr. Weishaupt, of Hanau, in the tastefully designed chessboard which he exhibits, has also made an artistic use of surface enamelling, both in the dresses of the chessmen and the ornament of the table; while the choicest specimen of the combination of many materials to form a rich and beautiful work is seen in the shield of Faith, presented by His Majesty the King of Prussia to his godson, the Prince of Wales; it was designed by Cornelius and Stüler, and executed by Hossauer, Fischer, and Mertens; and is rich, without the slightest tendency to excess. The subjects, from the Scriptures, in silver, are ably executed in low relief, and carefully chased; the single figures of the apostles beautifully designed, as are the accompanying enamels. The ivory forms that frame in the compositions towards the centre, and surround the outermost rim of the shield, not being continued through the compositions of the outer margin, there is a slight appearance of its wanting constructive framing in that part, and there are three different scales of figures in the compositions. With these slight exceptions, it is both a beautiful work of art and a rare example of the skilful combination of precious materials, as well as of unity of intention in the whole composition.

The natives of India have long been skilled in the art of enamelling both on metals and for jewellery: the works exhibited in the cases of the East India Company contain many interesting specimens of this art—both applied to the surface of domestic utensils, as flagons, cups, &c., and to necklaces, bangles, and articles for personal adornment; the portion of a dagger-case given in Figure I., Plate 3, is beautifully ornamented with enamelling, and is not only a choice example of the art, but of the Indian treatment of flowers as ornament. An enamelled incense-burner of large size, and the flower-vase inserted in the remarks on pottery (page 1645), both from China, and exhibited by Mr. Alcock, are beautiful and choice productions in this art.

If we can allow such works as testimonials, racing-cups, centre-pieces, and others of the like character, to be given up to the treatment of the artist, there is still a large number of other articles in the precious metals and their representatives having a defined purpose as utensils, and strictly devoted to a use, which must belong to the domain of the ornamental designer, and be subject to all the laws of his art. Of these, utility should be the first consideration. They should be composed on geometrical forms and have a symmetrical construction. Capacity and mobility, in most cases, will have to be regarded, in connexion with proper stability and solidity; and it should be remembered that, as domestic *utensils*, they are not to be placed under glass shades, and therefore will require constant cleansing and polishing, and that, not at the hands of the silversmith, but of the butler or his assistant. This alone ought greatly to regulate the treatment of surface, which

should be such as will best display the beauties of the metal, and yet not render it liable to injury under such cleansing. Then again it is usual to make the handles and knobs points of ornamentation, and this not improperly; but it should not be forgotten that they are to be grasped for lifting, and should be convenient for that purpose. And neither in these, nor, indeed, in any other part of the ornamentation, should the relief be so bold, or project so far, as to be liable to accident or entanglement in the use of the articles. Some of these remarks may seem almost uncalled for, but are not so: nor are the errors recited confined to English manufactures, but are equally evident in those of France. Thus it is impossible to justify large and florid groups of dead game, of fish, of fishing utensils, or the like imitative treatments, as the knobs of dish-covers, or the handles of tureens; however beautiful in design or excellently chased, they are not convenient for use; nor can the hand be safely brought in contact with the metallic toes of a pheasant, the tentaculæ of a lobster, or the twigs of a fish-basket, any more than stags with their branched antlers can well be laid hold of to remove a venison dish. Faults of this class chiefly arise from the natural or imitative treatment, which has to answer for so large a growth of errors.

It has before been remarked that the figures introduced into the ornament of metal-work are too often merely applied or stuck on, not arising out of the work as a constructed whole, and this more especially in those works which have been usually committed to the skill of the artist; but if not to be tolerated in those works, in objects of utility they are far more out of place, and *ornament* requires that figures should have an ornamental construction. It cannot be too often repeated, that imitative trees and foliage, flowers that are like the growth of the hothouse electrotyped, and which dangle and shake with every movement, as much almost as would their prototypes on their natural stems, are not ornament, are in the worst possible taste for any useful purpose, and have a flimsy and tinsel-like appearance, as much beneath the impressive effect in metal of even mere plain surface, as they are wide of any pretensions to fitness or propriety as works in metal at all. This naturalism is evidently a heresy of the artist's, and should have no quarter at the hands of the ornamental designer. In the section devoted to hardware, the treatment of metallic surface has already been the subject of remark; much of which will apply here also: but in connexion with this imitative art, it may be remarked that the frosting, which it renders almost necessary for its display, is even more opposed to the brilliancy of metal than that oxidation so useful in showing art treatment.

In jewellery, used for personal adornment, the fancy has full play, and the invention need be but slightly curbed by a consideration of use, such works being in their very intention ornaments; where precious stones are employed, the first object being to display them to the greatest advantage, the designer should be careful that neither gold nor enamel interferes with them, and that there is sufficient motion in the parts to bring the light into play on their surface. In mourning ornaments, bracelets, brooches, &c., M. Meurice has shown himself a skilful artist; here, indeed, the fancy of the French art-workmen has full scope, and in such smaller works in metal as cane-heads, seal-handles, buttons, snuff-boxes, &c., the most delicate workmanship is found combined with artist-like design and pleasing inventions, both by this exhibitor and in the articles displayed by Rudolphi

(France, No. 1465), Gueyton (France, No. 1619), and others. It only remains to remark upon some of the works for domestic use exhibited in this Class which have not already been spoken of or alluded to. One of the choicest works of utility is the tea-service of Eck and Durand (France, No. 1211), which deserves attention for the architectural arrangement of the whole as an harmonious composition, and for the beauty and elegance of the individual forms and their ornamental details; it is a thorough study of ornamentation; the figures, where introduced, are perfectly parts of the composition, and are oxidized to show the beautiful workmanship employed upon them; the ornament is in low relief over the surface generally, and parcels-gilding has been used to give expression where the treatment became confused by a little excess. The plateaus on which the cups, cream-vessels, &c., are arranged, are treated with ornament in niello, and every effort has been adopted to give variety to the surface without interfering with the general repose of the whole. Constructive use, moreover, has been well considered; the composition consists of a raised central urn, from which the water flows through several vents into four teapots arranged below, whilst chalices for sugar, cream-pots, &c., are grouped lower down in the arrangement, the bottom having spaces for the cups designated by circular groups of ornament in niello; the only difficulty is to conceive how so massive a piece of plate is to be filled at the top with hot water, and conveyed into the drawing-room, without discomposing its general arrangement: in addition to which, it certainly has the fault of being over ornamented, notwithstanding the great care that has been taken by low relief and otherwise to prevent such an appearance.

The work on the English side which most nearly corresponds with the last-mentioned is the centrepiece, the property of His Royal Highness Prince Albert, exhibited by Messrs. Garrard; this also has been designed with a proper sense of architectural arrangement, and is elegant in its general forms, especially the central tazza, while the low relief ornament on its surface is well considered and in good style; being entirely treated in gold, it has a tendency to monotony, counteracted as far as possible by a very judicious use of burnished surface. The portraits of animals introduced, although very cleverly modelled, do not harmonize with the general treatment. This collection contains also some well-designed salt-cellars, vegetable-dishes, and candlesticks, whilst even some works in the florid and nearly discarded style of Louis XIV. look almost satisfactory, compared with testimonials and racing-cups of the character before alluded to. Messrs. Hunt and Roskell's principal centre ornament and plateau exhibits some cleverly designed figures well modelled and with much appropriateness of subject, and it groups well as a composition. Many of the figures in the round, however, have too much the appearance of separate groups placed on the ornament and not forming part of it, a mode of treating such subjects which must be considered objectionable: this firm deserves great praise for exhibiting the shield and vase of M. A. Vechte. Messrs. Elkington's application of electrotyping to the reproduction of art and ornament has been successful as showing its perfect adaptability to this purpose. The "hours clock-case," designed and modelled by Mr. John Bell, is a good example; it is an artist-like work of much fancy, and is a great improvement upon the worn-out commonplaces which the constant demand for such works abroad has occasioned; it deserves notice as a work of art, but is

wanting in the symmetrical and architectural arrangement necessary to bring it properly into the province of the ornamentist. The repetitions of Mr. Bell's graceful statuette of Eve, Mr. Cheverton's reduction of Theseus, and of some mediæval examples of silver work, show the perfect applicability of the process. By this art also, in other hands, the shield of Æneas, designed by the late Mr. W. Pitts, a work of great merit, and the still more excellent work of Flaxman, the shield of Achilles, have been presented in metal, and every one must admire the beauty of relief, the richness of composition, and the classic feeling they exhibit; it is equally a subject of regret that they were never completed as works in metal by the hands of these artists themselves. Had they worked on the metal by the embossing process, which has been before enlarged upon, there is no doubt that the transference of the art from one material to another, from clay and plaster to metal, would have had a much fuller adaptation than mere repetition permits of, and would have placed these shields, as works in the precious metals, on a rank with the noblest labours of past ages.

The beautiful art-workmanship, elegant forms, and the ornamental treatments of metal in the small chalices and dagger-handles exhibited by Marrel Brothers, should be alluded to, as well as the execution of the cup by Le Brun, exhibited by Eck and Durand, since the art employed upon them is of the true character for such works; but it is not necessary to lengthen the Report by specially adverting to many other works which, while they contain much individual merit as efforts of skill, or even separately considered as efforts of art, are not consonant with the view herein taken of such labours; at the same time it must be remembered that many of the foregoing remarks are intended to apply to the views adopted in treating such works as testimonials, racing-cups, &c., not to disparage the ability of the many talented and skilful artists who have laboured upon them, rather indeed to show that what is often expended on mere material ought to be apportioned to the labours of the artist, and that by the means employed to work out their inventions they are overlaid with littlenesses and spoilt in production. Indeed, in England, the general impression resulting from an examination of the works in the precious metals would be, that the endeavour of the manufacturer was to give the greatest quantity of metal with the smallest amount of art, which is not so observable on the foreign side; the view intended to be promoted in this Report, is that art gives value to the metal, not the metal to art. A remarkable contrast in some respects to our own goldsmiths' work is seen in the collection sent by the Honourable East India Company; herein the least possible amount of metal is so treated by delicate hand-labour, by exquisite pierced work, enamellings, and inlays, combined with such a thorough consideration of the treatment of surface by bulb-work, &c., as to give the greatest amount of skilled workmanship with the smallest quantity of the material; and even in their commoner works (inlays and incrustations of silver on iron) there is such a due consideration in the first place of beauty of form, and such varied and beautiful ornamental arrangements of the details, that they well deserve the consideration of the ornamentist.

The Eastern nations largely practise the art of inlaying both in metal and in other materials, and their weapons of war are decorated with inlaid work, and with delicate chasings of the most fanciful and varied character; this is seen in

the works of that class exhibited by the Company ; they abound with ornamental inlays, &c., often extremely elegant, and always designed in strict accordance with true principles. Thus, the ivory inlays of gun-stocks, given in figs. 1, 2, 3, and 4 of plate 2, have all the elegance of the Renaissance, and the flowers adapted from nature, and traceable even to their originals, are yet perfectly conventionalized, flat, and symmetrically arranged—indeed, the proper *ornamental* treatment of flowers (the search after what is beautiful and *characteristic* in their form and colour, and not the *imitation of them*) is always attended to in Indian ornament, as a reference to the floral forms in each of the three coloured plates will prove. Almost all the arms exhibited are more or less ornamented, containing a store of suggestions most valuable to the manufacturer, and a rich mine of study to the ornamentist : among other qualities these works display is the tasteful distribution of the ornament, the sense of just quantity ; it is rarely that a border contains too much or too little ornamental form, that a diaper is too crowded or too vacant, too large or too small ; a reference to the inlays of plate 2, or to the textile fabrics in plate 1, equally illustrates this truth. Nor is this excellent art applied only to costly goods ; the same just principles are evident in the cheapest, and the lacquer workboxes (of which a specimen is shown in figs. 2 and 3 of plate 3), a manufacture of the cheapest kind, show the taste and skill of the Indian workmen equally with the more costly enamelling of the dagger-case (fig. 1) on the same plate. The inlays of silver in iron, for various domestic and personal utensils, such as hookahs, flasks, bottles, tazzas, &c., are not only simple, beautiful, and correct in their appreciation of quantity, but strictly ornamental, and abounding in suggestions of great value to those who will attentively study them : a single specimen, the inlay of a hookah, is given in fig. 5 of plate 2 : the same principles, applied to a great variety of forms, are exhibited in many works in the Indian Court. There can be no doubt of the superior workmanship of some of the best European inlayers, but in much of the ornament, and in all the true principles for its application, they had been forestalled by the natives of our Indian possessions, and by other Eastern workmen. The inlaid and incrustated arms of M. le Page Moutier (France, No. 1364), and M. Zuloaga, of Madrid (Spain, No. 264A), are beautiful specimens of ornament and workmanship, while M. Falloise, of Liège (Belgium, No. 384), and M. Roucou (France, No. 1689), are successful exhibitors of inlaid work applied to other ornamental purposes. These inlays and incrustations are a means of most agreeably diversifying surface with ornamental tracery and beautiful lines without interfering with the general forms of objects, and deserve more attention than has been given them by our artists.

Works in plated metal have been little alluded to in this part of the Report, but it is to be remembered the object is rather to remark on design and style generally, and that the rarer efforts in the richer material will always set the taste in the imitative productions. The art applied to gold and silver in its turn descends to plated wares and manufactures in the baser metals ; indeed it has rather been the object to show how completely a false view of art tends to assimilate the costly with the cheap ; and it is not too much to say, that in many respects the exhibitions of the Sheffield and Birmingham manufacturers vie with the labours of the gold and silversmiths, whilst in so far as they sometimes recur to

Fig. 1.

PLATE I

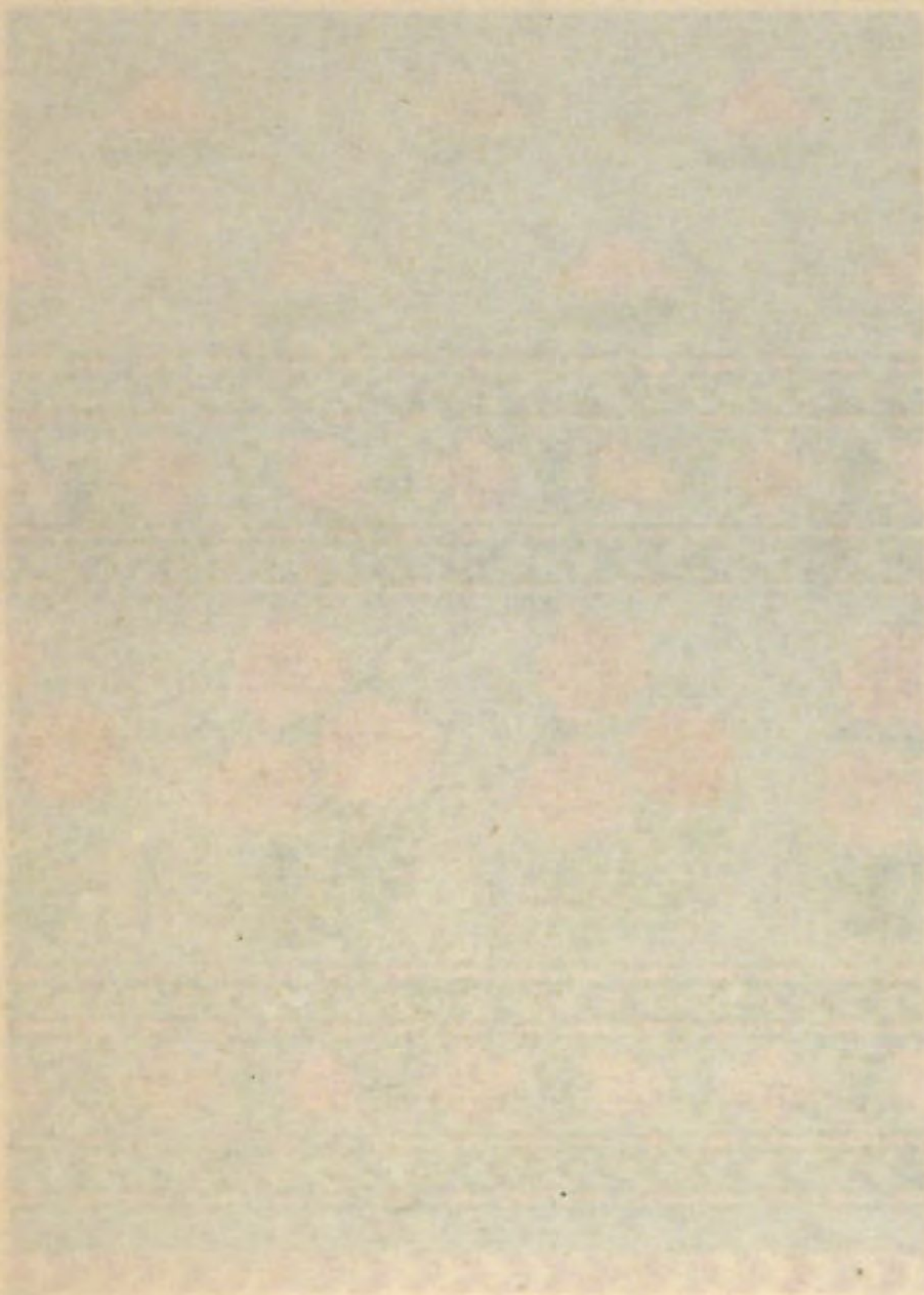


Fig. 2.

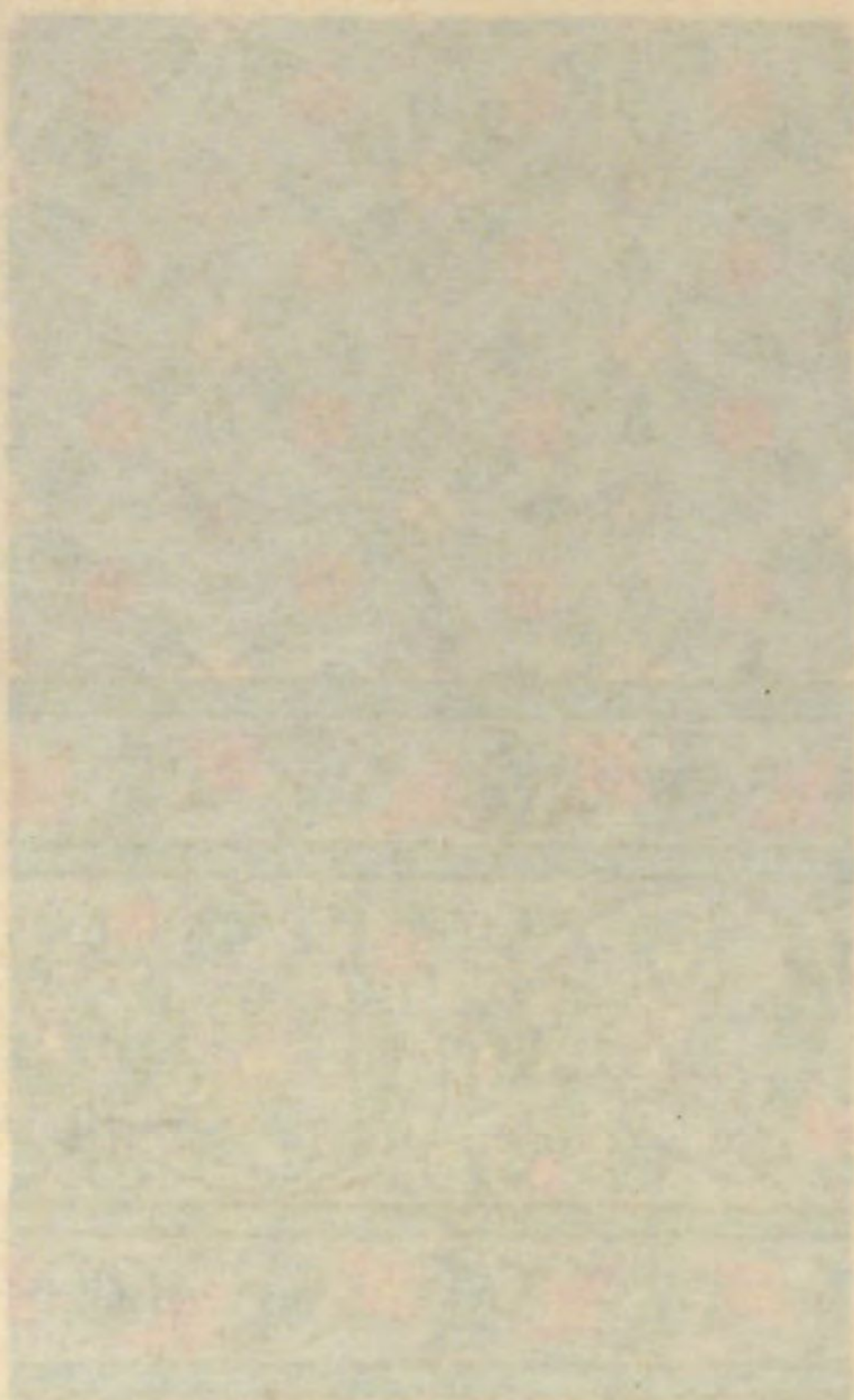


Fig. 3.

Fig. 3. (continued from Fig. 2.)

Fig. 1.



Fig. 2.



Fig. 3.

Day & Son, Lith. to The Queen



Fig. 1.



Fig. 2.



Fig. 3.



Fig. 4.

Designs for Book Covers.



Fig. 5.



Fig. 1.



Fig. 2.



Fig. 3.



Fig. 4.

Fig. 1.



Fig. 2.

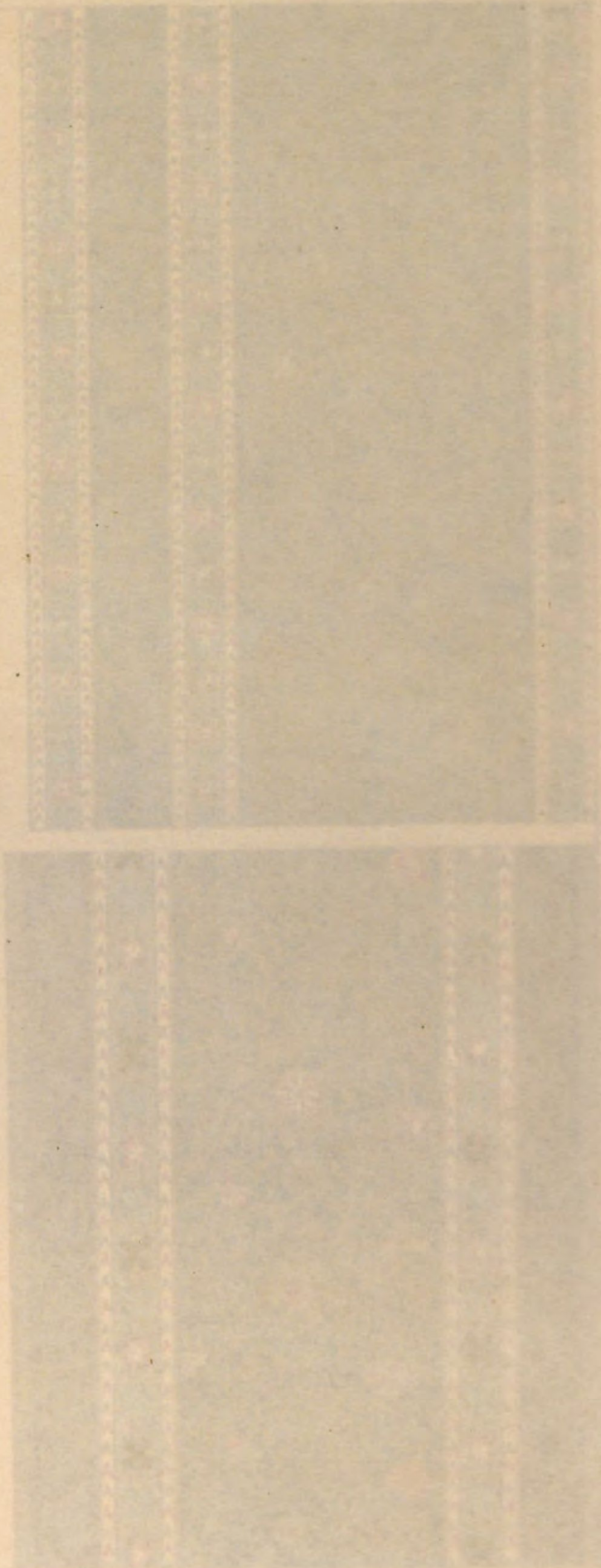


Fig. 3.

Fig. 4.

Fig. 5.

Fig. 1.



Fig. 2.



Fig. 3.

Day & Son Lith^{rs} to The Quern.

the purer examples of past ages they are occasionally in the better taste of a better instructed age.

BOOKBINDING.

The concluding subject of this section has reference to bookbinding and the "design" applied to that branch of industry. In the Exhibition there is not a very large display under this head; but a few remarks are necessary to counteract a direction of such labours apparent even there, and much more largely seen in the general works of the time. This consists in overlooking the only true intent of the art—the appropriate protection of literary works—in order to make it a vehicle of such gaudy ornamentation and decorative display as shall serve to attract to their contents, the outside garb being a presumed measure of the inner excellence, a practice not more degrading to art than it really is to literature. Such attempts induce the use of crude and harsh colours, and lead to excess in gilding, to heavy and coarse imitations of carved work in leather, gutta percha, and even less durable materials; to perspectives and pictures on covers, to improper and inconsistent applications of metal work, and numerous other objectional practices, which, as they do not tend to utility, and are opposed to the true spirit of the binder's labours, must be avoided if the art is to attain to the simple excellence of the mediævalists or to the chaste richness of the binders of the sixteenth century. It is no doubt admissible, nay desirable, that the outside decoration of a book should have some reference in its ornament to the inside contents; but still the details chosen should be amenable to ornamental treatment, should not be mere conceits, and, as has been so often reiterated, should not be mere reproductions of the ornament proper for a totally different material. Thus a painter's palette, with its range of tints prepared for study, let into the cover, can hardly be supposed the appropriate binding for a work on colour, apart from the impossibility of any symmetrical arrangement of the object itself, or of the tints upon it, for its newly adopted purpose. Neither is the perspective delineation of the apse of a cathedral a proper ornamentation for the cover of a "Church Service," any more than the host of treatments in the same direction, consisting of the fronts of cathedrals, oriel and rose windows, and stone tracery of many kinds, so often adopted for such purposes. In all tooled work and block impressions, bookbinding requires flatness of treatment as one of its first principles; interiors of churches, perspectives of tunnels, and even figures, pictorially used, are quite out of place. Heraldry and heraldic devices should be displayed flat, and even strap-work, or mere combinations of lines, should not be arranged so as to give the appearance of projection, any more than coloured materials or mosaics should give the appearance of relief, although the fine old Grolier bindings and other works of the *Renaissance* period sometimes offend against this rule. Another class of errors arise from mere imitation of details without full consideration of their intent and use. Thus, formerly, when the heavy Church Services were really bound in boards and richly ornamented, hinges were a necessary appendage, as well as bosses, by their projection beyond the surface to protect any delicate carving, rich tooling, or rare metal work inlaid into the cover; and, at present, in books of constant use, of large size, which require great strength, and come under the same conditions, the use of these appendages is desirable and appropriate. But that which is proper for a copy of the Scriptures or a Church

Service, for the lectern, is hardly suitable for a book for the pocket; yet these miniature works are *ornamented* with hinges and bosses, sometimes really in metal, and sometimes only imitated as tooled work on the surface of the leather. Even in some works, where their introduction is appropriate, their intention is at times overlooked or disregarded; thus in a choice metallic binding of a book of "Hours," by Madame Gruel, the figure of the Virgin Mary in the centre, whilst it has a higher relief than is suitable for a book-cover, projects moreover beyond the impost of the decorative bosses at the corners of the cover, which ought to serve as its protection.

The "designs" for bookbinding are principally those exhibited on the English side by Mr. D. Wyatt and by Luke Limner (Mr. B. Leighton); the works of the former gentleman, whilst they are rich and decorative, and on just principles as to flatness, are somewhat overcrowded and a little deficient in simplicity, which is rarely the case in the best works of the binders of the sixteenth century. The works of the last-named exhibitor may be better judged of by the bindings from his designs in Class XVII.; while they evidence much fancy and invention, they show a strong tendency to the picturesque, and are at times wormy and meagre in style.

Among the works exhibited may be mentioned, for good design, the bindings by M. P. M. Lortic (France, No. 1652), "L'Orloge des Princes," decorated with a diaper of fleur-de-lys on a dark ground, and a "Catholicon," although this latter is rather deficient in the proportion of its margins. The works of J. Simier (France, No. 693), and J. E. Niedrée (France, No. 665), have also merit, although it consists rather in adopting the style and labour of the past than in any peculiar novelty. This is more or less the case on the English side also, the best works being imitative of old German, French, or mediæval bindings. "The Illuminated Book of the Middle Ages," as bound by J. Wright (Class XVII., No. 139), has much merit, although wanting in a nice adaptation of the ornament to the corners. "The Glossary of Ecclesiastical Ornament" is also good, although the whole surface is too generally covered, and the margins too narrow, for the size of the diaper. The cover of "Thomson's Seasons," by Leighton, is one of the best designs of Luke Limner, and the washable enamel binding, in variegated colours, by J. S. Evans, has merit in its application of colour if not in novelty of design. Messrs. De la Rue, in works of actual bookbinding, as well as in much that is allied to this branch of industry, exhibit some specimens of good design, the ornament being composed of combinations of leaflets symmetrically arranged on flowing lines of stems, showing how a principle duly carried out is sure to result in giving a novel and distinctive character to design. There is a harmonious unity about these works, but they are a little frigid and inclined to poverty, which does not, however, necessarily belong to the style adopted. Some fancy papers, exhibited by this firm, are greatly to be praised; the ornament (in various styles) is most agreeably distributed, the forms flowing and elegant, and richness attained without gaudiness. Some of these patterns would work well in silk or poplin, or even be suitable for printed fabrics; and it is in this manner that the design of one manufacturer, properly understood, *may* apply to another, where there are many qualities common to both, and no principle infringed in such adoption.

DIV. 4.—*Garment Fabrics.*

Perhaps there is no subject which comes under review in this Report of more importance than the consideration of design as applied to garment fabrics, since the amount of skill and labour engaged in their production forms so large a part of the industry of the world. Moreover the design applied to apparel must exercise a great influence over the general taste of the public, and persons who have been accustomed to consider gaudy, florid, and large ornament suitable for articles of clothing, will hardly be capable of judging correctly of what is true, beautiful, and appropriate, in the ornament of the domestic utensils and furniture of their dwellings. The great sources of error in designing for garment fabrics are over-ornamentation, and attracting undue attention to the ornament—which may arise from many causes; thus from the violence of contrast either of light and dark or of colour, from overcharging the colour, or from the ornament being too large for the fabric. All these causes, however, are modified by the material. Thus muslins and barèges will bear more pronounced contrasts than the more solid or more absorbent textures of jacquonet muslins or de-laines. Silks and de-laines, again will bear greater fulness of colour than the drier surface of cotton; while woven patterns in silk, formed by tabby and satin in a self colour, will bear much larger figures than are applicable to either woven patterns in varied colours, or the same printed on cottons or silks. Thus, the pattern inserted (G. F., fig. 1)—half the size of the original—is from a printed barège, and will



Fig. 1.

give the largest scale of pattern which appears suitable for the open texture of this material; it would, however, even in the reduced size of the woodcut, be far too large for a Swiss cambric, although it might be even larger than the original size of the pattern on a self-coloured figured silk. These observations will show the necessity of the designer carefully attending to texture, lustre, &c., in preparing his design, and illustrate the difficulty of adopting without adapting the ornament of one fabric to the decoration of another. The flowing lines, agreeable distribution, and flat treatment of the details will illustrate other points in these remarks. See also the pattern of a de-laine (G. F., fig. 2), and of a muslin

(G. F., fig. 4). Though the relative scale of the pattern, however, is a most important consideration, it is difficult, even after the above considerations, to arrive at any absolute rule on the subject, since the person and the stature of the wearer of a garment must have some weight in determining the suitable size of the pattern. Generally speaking, however, ornament for such fabrics should consist of small, rather than of large forms—should be treated flatly, and without light and shade—and inclined to subdued contrasts of colour, and of light and dark. A geometrical rather than a dispersed* arrangement of the forms moreover would be found the most agreeable to the eye, and the most consistent with sound principles, some of the best patterns being formed by diapering sprigs, leaves, flowers, or often even simple geometrical forms, regularly over the ground. That such patterns are essentially in good taste is shown by their constant reproduction for the more cultivated class of customers; whilst the sprawling trails, and coarse imitative treatments brought out from year to year as the novelties of the season, pass away and are forgotten, or are thrust cheaply on the market at a low cost, to catch persons whose taste is regulated by their pockets, rather than by their cultivated senses. To see the above principles carried out fully and completely, it is necessary to call attention to the garment fabrics exhibited by the East India Company: these are almost wholly designed on the principles here presumed to be just ones; the ornament is always flat and without shadow; natural flowers are never used imitatively, or perspectively, but are conventionalized by being displayed flat and according to a symmetrical arrangement; and all other objects, even animals and birds, when used as ornament, are reduced to their simplest flat form; when colour is added, it is usually rendered by the simple local hue, often bordered with a darker shade of the colour to give it a clearer expression; but the shades of the flower are rarely introduced; the “cloth of gold figured in the loom,” (fig. 3, plate 1,) and part of an Indian scarf, (fig. 2, plate 1,) illustrate fully these remarks. The ornament is geometrically and symmetrically arranged, flat in simple tints, and bordered as above described, with darker shades of the local colour. The principle of colour adopted is a balance of the complementaries red and green, in both cases with white introduced to give points of expression, and to lead the eye to the symmetrical arrangement of the ornament: in figure 3 purple is introduced to harmonize with the gold ground, a harmony very frequently used in the rich tissues of India; in figure 2 variety has been obtained by introducing two reds, giving an interchange of a lighter tint in every other flower in the border. The borders of these scarfs are beautifully illustrative of the simple and graceful flowing lines which characterize Indian ornament: and in figure 2 we can observe the difference between the eastern and the mediæval patterns; while the same principles are acknowledged in both, the latter are often stiffer and more angular than the graceful sprigs of this border. Both these works show how much beauty may be obtained by simple means when regulated by just principles, and how perfectly unnecessary are the multiplied tints by which modern designers think to give value to their works, but which increase the difficulties of production out of all proportion to any effect resulting from them, nay often even to the absolute disadvantage of the fabric.

* By dispersed, is meant the attempt to distribute the pattern over the ground, without any apparent arrangement.

If we look at the details of the Indian patterns we shall be surprised at their extreme simplicity, and be led to wonder at their rich and satisfactory effect; it will soon be evident, however, that their beauty results entirely from adherence to the principles above described. The parts themselves are often poor, ill-drawn, and commonplace, yet from the knowledge of the designer, due attention to the just ornamentation of the fabric, and the refined delicacy evident in the selection of *quantity*, and the choice of tints, both for the ground, where gold is not used as a ground, and for the ornamental forms, the fabrics, individually, and as a whole, are a lesson to our designers and manufacturers given by those from whom we least expected it. Moreover, in the adaptation of all these qualities of design to the fabrics for which they are intended there is an entire appreciation of the effects to be produced by the texture and foldings of the tissue when in use as an article of dress, insomuch that no draught of the design can be made in any way to show the full beauty of the manufactured article, since this is only called out by the motion and folding of the fabric itself. An expression of admiration for these manufactures must be called forth from every one who examines them, and is justly due to merits which are wholly derived from the true principles on which these goods have been ornamented, and which result from perfect consistency in the designer.

In reverting to the general question of design for garment fabrics, it may be remarked that the making up of such goods for use should have due consideration in the general direction of the pattern. Thus while, "up and down" treatments in stripes and trails are proper, the horizontal direction of pronounced forms is not to be admitted, since, crossing the person, the pattern quarrels with all the motions of the human figure, as well as with the form of the long folds in the skirts of the garment; from this reason, large and pronounced checks, however fashionable, are often in very bad taste, and interfere with the graceful arrangement of any material as drapery.

In designing for garment fabrics, it will generally be found that the simplest patterns are in the best taste. The efforts, however, both of designers and manufacturers, have been too often directed to difficulty and complication, rather than to produce the greatest effect with the least possible means. Thus we find the number of blocks used in printing any pattern, or of colours in weaving, or the number of cards required to produce a certain design, dwelt upon, rather than the excellence of the design itself, and gaudiness and ugliness are estimated, if expensive and troublesome in production, rather than beautiful simplicity at small cost. As simplicity is one of the first constituents of beauty, it will often happen that simple patterns are far the most beautiful, and that one printing, or weaving in one colour, is in good taste, while every multiplied difficulty becomes further removed from it. It has before been said, that calling undue attention to the ornament is a great error in designing for garment fabrics: there needs, in the larger masses of the dress, a sense of what a painter calls *breadth* or repose, which is only attainable by great simplicity, by flat or diapered treatments of small forms, by uncontrasted light and dark, and delicate tints of colour: those difficult patterns of many parts are too apt to offend against the above requirements, and to cause the figure to stare upon the ground and attract attention to itself, to the destruction of the true decoration of such fabrics.

In examining the designs for garment fabrics, both British and Foreign—many of them of great merit—two things immediately strike the observer, namely, that while there is great evidence of the interchange of ideas between European designers and manufacturers (the same patterns or modifications of them being seen on both sides of the Building), it is impossible to fix on any general principle or principles that have circumscribed the efforts or regulated the taste of European designers as a body, or of any one of them as an individual. Thus we have the same artist exhibiting patterns consisting of natural imitations—patterns founded on symmetrical and geometrical arrangements—flat and shaded treatments—trails dispersed over the surface—or sprigs diapering the ground—minutely small or coarsely large forms—indeed showing his abilities indiscriminately without any apparent preference, in any and all styles and in manners most opposite. The case is entirely different in the Indian *fabrics* exhibited (for there are no designs), whether carpets, embroidery, or for garments; three or four leading and governing principles being prominent in all such works. These appear the result of science, the other of chance; and it is singular in this age of desire for novelty, that no manufacturer or designer has thought of seeking excellence or singularity, and therefore celebrity, by a rigid adherence to some fixed rules of design; seeking beauty of form, and arranging colour in compliance with their dictates, and repudiating that off-hand lawlessness which is the universal practice. In view of this general dereliction, this equal indifference to principle, it becomes desirable to examine the causes of failure, and to endeavour to impress the value of the principles which have been neglected, rather than to offer especial remarks upon the designs exhibited in this section, and since, without the insertion of many illustrations, it would be impossible to advert to the fabrics themselves, to consider designs, and ornamented fabrics, at the same time.

In the section on the precious metals it has been stated that imitation is not one of the principles of ornamental art generally, but rather one of the elementary bases of fine art, and it is now desirable to give another distinctive difference between the two which will serve still more to define their respective provinces. It is, that geometry, not necessary as a principle of art, is essentially required as the basis of ornament; thus the grouping and arrangement of art is picturesque and dissymmetrical, and consists rather of unequal quantities, except in some of the works of the early artists, which had an ornamental source. Ornament, on the contrary, has a geometrical distribution, and is subject to symmetry and correspondence of parts, and it may be truly said that it is confounding these provinces, and a departure from this true foundation on the part of the ornamentist, that has caused so much bad ornament in the various manufactures of the Exhibition, and in none more than in the textile fabrics. Thus it is not possible to cover a large space with a repetition of small ornament, without *some* symmetrical arrangement developing itself, however studiously we may endeavour to avoid it, the necessary “repeats,” for instance, leading to the development of the square. In such *dispersed* patterns, therefore, some amount of symmetry is produced by chance; thus the pattern (G. F., fig. 2) has not been founded on any geometrical lines, yet a four or five fold repetition would develop a regular arrangement of parts, some determinate recurrence of the berries, for instance, subject to a symmetrical law of lines. In such a case, then, the geometrical

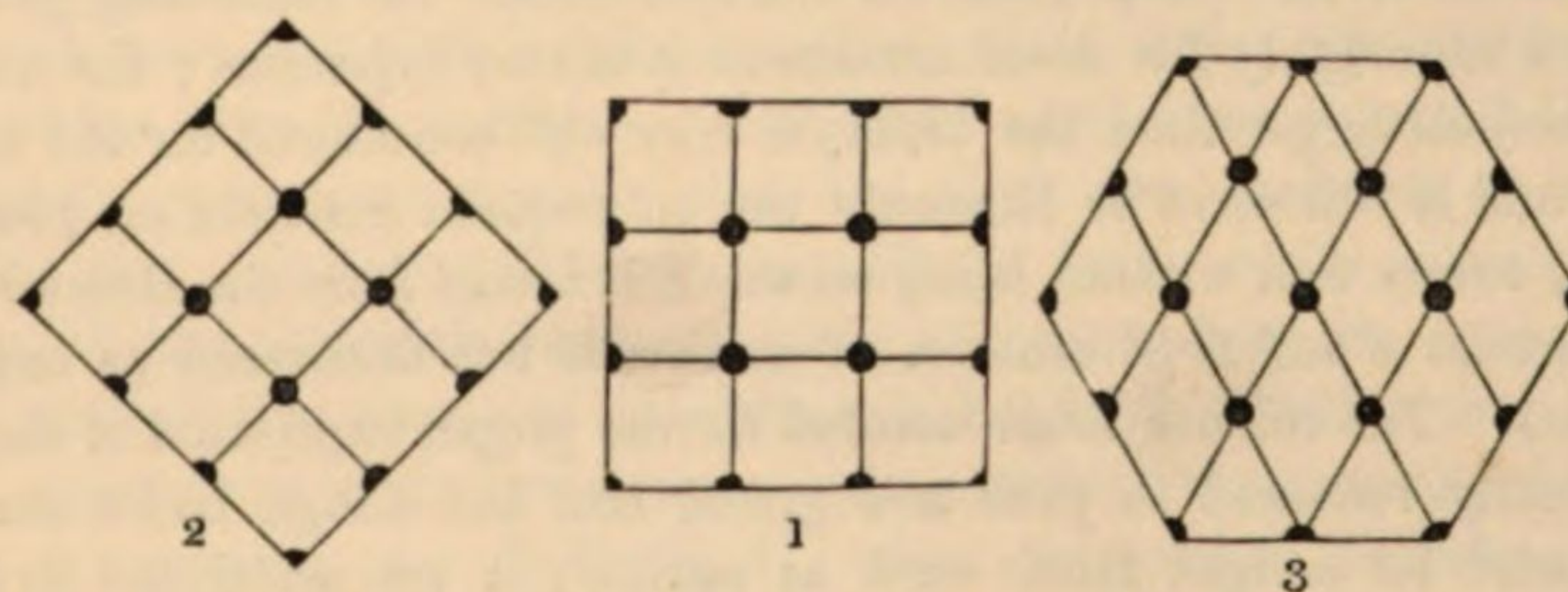
law of recurrence is arrived at adventitiously, the necessity inducing it being ungoverned by the controlling will of the designer, who therefore has neglected



Fig. 2.

all the beauty resulting from a proper choice of the regulating form. Moreover, if a repetition by means of blocks or cylinders wholly without a symmetrical arrangement is an impossibility, would this not lead us to infer that symmetry is a law of nature not lightly to be broken through or disregarded, and should it not induce us to search for those geometrical figures which give the best distributions of quantities, and the arrangements most pleasing to the eye? In fact we ought not to attempt to overcome this law, but to accept it, and so regulate it as to give effect to other qualities essential to beauty, such as proportion, quantity, grace, and harmony of colour.

Having shown then that symmetry, regulated by geometrical forms, should govern the distribution of ornament, a little investigation would lead to the causes why



certain symmetrical arrangements please more than others; thus the square of equal sides and equal angles (fig. 1) is the simplest and least varied basis of distribution, the most obvious regular figure, and at the same time the most inelegant and commonplace; simply changing the direction of the lines, however, and placing the square lozengewise, as in fig. 2, gives a decided improvement; variety is partially joined to perfect symmetry, and a more pleasing arrangement of the forms and quantities is the result (fig. 2). Then again, if we not only change the direction of the governing lines, as in the last figure, but their angle also, as in fig. 3, and adopt the equilateral triangle and the lozenge which is its plural, we have a further variety, in the interchange between the upright and perpendicular

spaces of the quantities, and the result is a still more elegant distribution arising from the mere variation of arrangement of the same simple details. Having arrived at these facts as a starting point, viz. that symmetry is a necessary condition of repetition, and that symmetrical beauty is largely influenced by the angle or combination of angles which govern it, we may pass from the right angle, and the angle of sixty degrees which forms the equilateral triangle, to study arrangements under various other geometrical combinations, founded on other polygons and on ordinate lines from the various intersections of the sides of polygonal figures; such as hexagons, octagons, &c., of an equal number of sides; or triangles, pentagons, &c., of an unequal number, developing many beautiful symmetries and proportional arrangements.

Thus the design inserted (G. F., fig. 4), intended for a printed muslin, is founded

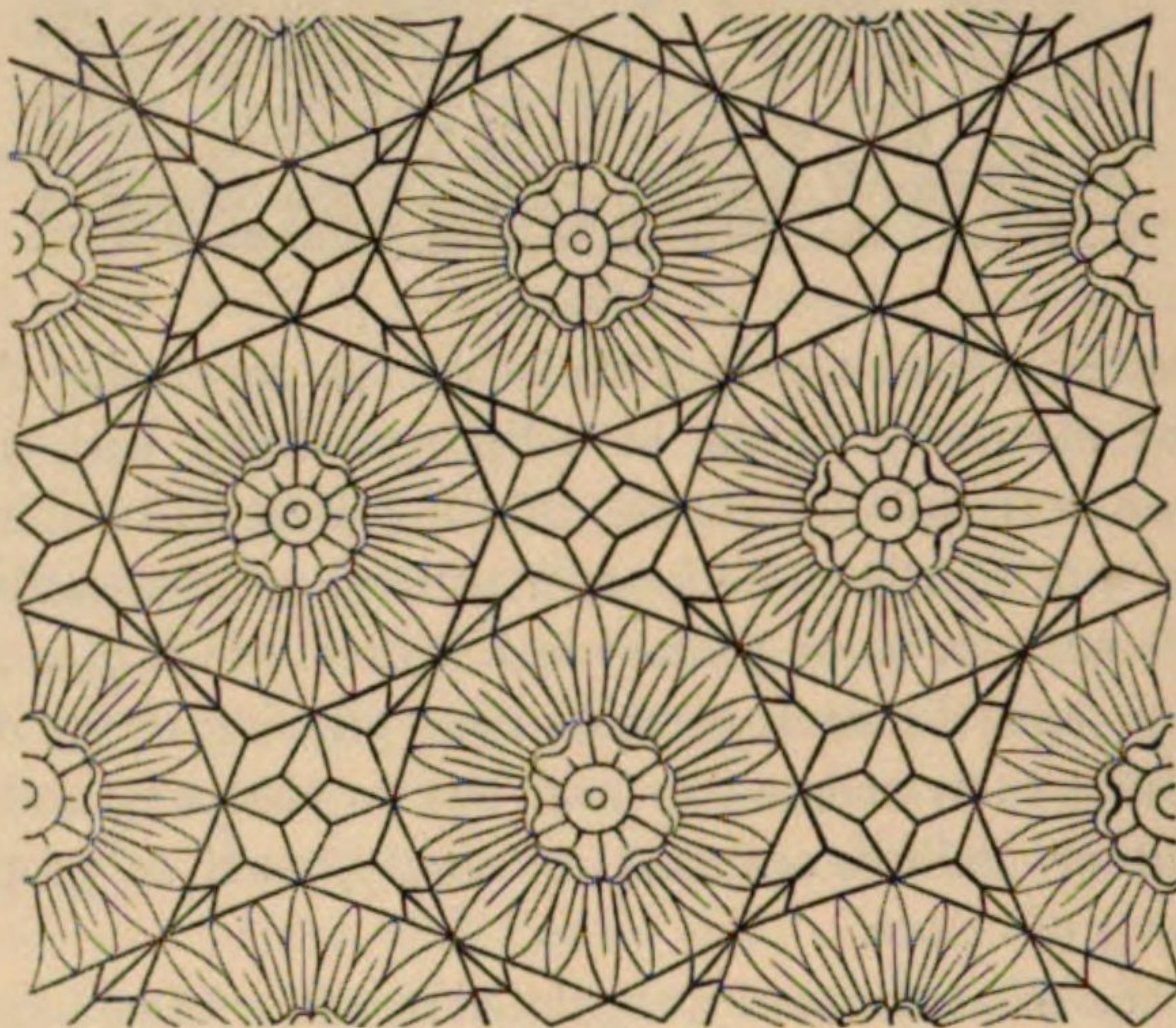


Fig. 4.

on combinations of the octagon and its ordinate lines. As combining geometrical forms with a thoroughly flat floral treatment it is very ingenious; the size of the pattern (one-half larger than the block) is very well considered for the texture of the fabric, and it will serve to illustrate the subsequent remarks on *quantity*, as the pattern covers well without being crowded, is *broad* from the absence of harsh contrasts, whilst a sufficient amount of surface is left uncovered as required by this material. The colours, much wanted for the proper expression of the pattern were delicately rendered in pink and green, and the design had a character of much elegance for a light fabric such as muslin; it was exhibited by Florence Collins, among the works of the students of the Government School of Design.

Geometry then is the basis of symmetry, leading the way to those arrangements which best govern the general distribution of *form*. If this view of the value of geometrical arrangement is correct as to the distribution of *form*, it is still more so as to colour; some colours require definite arrangements in juxtaposition with one another for harmony, and are governed by their own laws of relative quantity, having reference to their power of mutual neutralization, as three yellow, five red, and eight blue; such arrangements being more easily obtained and regulated on a geometrical basis, than on those dispersed patterns which arise out of repetitions of the accidents of growth, or natural imitations.

The subject next in importance is *quantity*, by which, in the decoration of garment fabrics, the taste of the designer is so largely made known. The due appreciation of quantity regulates the amount of the surface of the ground to be covered by the ornament, the interspaces between diapered forms, and the size of the ornamental details, especially in relation to the geometrical bases which govern the grouping; thus in the figures 1, 2, and 3, the spots which are regulated by the ordinate lines might be larger or smaller, or, instead of them, the lozenges might be filled wholly or partially with ornament, as in the design inserted (G. F., fig. 4), the beauty and elegance of the design largely depending on the proper quantity admitted. Here the taste of the designer is exercised where rules help him no longer, but where he is guided by the considerations before mentioned as to textures of stuffs and qualities of surface, very important considerations which will be further spoken of. A study of the Indian tissues will show how well understood *quantity* as a source of excellence is in the East, their quantities being generally extremely suitable to the colour and texture of the material sought to be ornamented.

To recur to the subject of textures and surface as important considerations regulating design. It is too much the custom with designers to imagine that the patterns applicable to one quality of surface may be used indiscriminately for another, and that which is successful in one material, or by one process, must necessarily be a success in another; thus, no sooner does a pattern in silk or worsted obtain the notice of the public than it is immediately copied in printed cottons, without any regard to differences of material or modes of production, to the lustre and richness which belong to the former, and must be wanting in the latter. In adopting the patterns of the weaver, the progress by squares necessary to the weaving process is imitated in printing where it is neither suitable nor required; sometimes the whole texture and treatment is copied on the cylinder. As an observable instance, no sooner did alpacas make a strong impression on the public and become popular, than their low tones and broken tints were imitated largely in cotton prints, which almost changed their character from this circumstance, a low-toned surface or ground being adopted with slightly contrasting figures; they lost their own character to take up an unsuitable one. Cotton prints are capable of being easily cleansed, and the whiteness of the material is a great cause of beauty from its appealing to our sense of purity; this source of excellence is heightened rather than diminished by such a treatment of the ornament as contrasts with the general ground without covering it too much (see G. F., fig. 4); when the ground, therefore, is entirely covered, as in these imitations, this appeal to the eye is lost, and, however suitable such patterns may be for the poorer classes, they take from the true beauty of the fabric. The contrary is the case with woollens; the material does not admit either of the same easy purifying, nor has it the same native whiteness; the whole ground, therefore, may be coloured, or where its native hue is retained it must be more largely covered with the pattern. Thus fig. 2 (page 1669) is a pattern of a de-laine manufactured by Dolfus Meig and Co., and shows not only a proper flatness of treatment, but an agreeable quantity and a due amount of the surface covered by the ornament, and is therefore suitable for such goods.

The consideration of texture and surface is necessary in the application of

design to other fabrics as well as cotton, and to other means besides printing ; thus colour, which has such effect on printed woollen goods, and shows with such richness and fulness in the absorbent material of de-laines and flannels, where it may be used broken over nearly the whole surface, is apt to destroy more valuable qualities when applied in varied tints to the decoration of silk, and should be used more sparingly on this material either in woven or printed patterns, leaving large spaces of the ground untouched, so much of the true beauty of silk residing in its lustrousness and the textural beauty of its surface. Of course this remark does not refer to self-coloured silks or to figured brocades in a self-colour, where the greatest brilliancy of colour does not interfere with the textural beauty, but only to weaving or printing patterns, consisting of many colours, too largely over the surface ; the fact is, that a variety of colours tends to vulgarize both cotton, woollen, and silk fabrics, and, although least objectionable in woollen goods, they want an attention to laws of harmony which either has not been given them, or is not easily attainable by those hues which chemistry has placed at the command of the manufacturer as comprising durability among their other qualities.

The proper treatment of texture has other considerations as respects the ornamentation of garment fabrics which may find a place here, although a little irrelevant to the present matter ; graceful and elegant foldings are very important in all goods intended for personal wear, and many of the most beautiful qualities of materials are brought out by the interchange of light and reflection playing over their surface on the motion of the wearer ; it is important, therefore, that no mode of decoration should be adopted to destroy this quality, even irrespective of the sacrifice of proper utility which takes place in all works so overcharged with decoration or stiff from embroidery as to impede ease of movement and freedom of action in the wearer : the full lustre of silk more especially is dependent upon the folding, and every fabric is more or less influenced by the same cause. When gold or silver threads are introduced in the weaving, stiffness must result from it, and the skill of the designer should be so exercised as to give the greatest effect from the least possible use of such materials. This has been particularly understood in the Indian tissues, which exhibit the best effects under folding in a remarkable degree, while the opposite error was noticeable in many costly priests' robes exhibited in the North-East Gallery, so stiffened with gold and covered with raised embroidery that the wearer must be encased in them as in a suit of armour ; the whole were not only vulgarized by excess, but were perfectly unsuited for use, and for the best display of those ornamental qualities sought for. The priests' dresses exhibited in the Mediæval collection had not this error ; they were soft and flexible as the tissues of India, yet rich withal and fully decorated, suitable for use, and adapted to give the best effect in that use.

The restrained use of means has often been before adverted to, nor is it unnecessary to recur to it in this section also ; under the old and simple methods of cotton printing, when the resources were few and the means limited, the style was in some respects better than at present obtains. Thus block-printing by hand required flat forms and flat tints diapered regularly over the surface, and some simple flower or leaf so used had a pleasing and just effect, of which Peel's well-known parsley-leaf may serve as an instance. It will at once be seen that these qualities are herein advocated as *principles*, to be filled up and enriched by

more modern resources, yet as ascertained truths not to be departed from. In the place, however, of the former limited means, printing from metal cylinders has put at the command of the designer all those powers of more perfect imitation enjoyed by the engraver, and, instead of using them as they should be used, consistently with the requirements of manufacture and the principles of ornamental art, they are wasted on the *imitation* of flowers, foliage, and accidents of growth, quite out of ornamental character and opposed to just principles.

Having thus remarked upon the principal excellences and defects of design in this section, it is felt that the difficulties before stated, arising from the varied principles adopted by one and the same manufacturer, the large number of the works exhibited, and the impossibility of referring to any particular work alluded to, almost entirely preclude any comment upon individual works. Generally, however, it may be stated that there is less dereliction from true ornamental art in woven than in printed goods, the powers of the weaving process being more limited than those of the printing process, so that varied tints and complicated forms fortunately present greater difficulties in production in the former than in the latter case. Thus whilst the skill of the designer, and, irrespective of principles, the taste of the printed silks of F. Choqueel must be admired, a comparison with woven silks of much simpler pattern would certainly result in the favour of weaving. Of this some of the silks exhibited by Campbell and Co. are examples, as well as the Irish poplins of Reynolds and Co., and Atkinson and Co. In these latter goods there is evidence of much taste, and a greater adherence to the principles herein laid down than in almost any other fabrics except the Indian. The mixed materials of Bradford and Huddersfield, and some of those of the same kind exhibited in the Zollverein by Messrs. Rurmann and Co., are also very satisfactory where those manufactures are not too attemptive; they bear the addition of crude colours ill, and the low tone and quiet contrast of such goods are greatly in their favour. Silk, as has been before stated, is so rich a material in itself, that colour is hardly needed, and where used it should be with great caution; the silk which forms the pattern on woven *mixed* fabrics is in itself a bright contrast to the more absorbent woollen ground, and should not be forced into opposition by bright colour; and in all cases the chance of error is diminished by abstaining from colour in pattern rather than the contrary: that crude colour is most dangerous in silk goods is shown in the very feeling that prompts to moderate it in chiné silk, wherein the pattern is blurred and made more undefined by the process of dyeing to get rid of the crudeness that must be caused by printing in colour on the finished material, and which would almost reduce silk to the grade of glazed cotton or chintz.

SHAWLS.

In the section of garment fabrics, design as applied to shawls has been reserved for a separate head; not so much from the importance of the manufacture, although even for this reason it would call for careful consideration, as that it leads to the examination of the principles on which these fabrics were decorated in the countries from which this article of dress has been derived to us.

The exhibited "designs" come first under notice: these are almost exclusively by French designers. The beauty, excellence, and costliness of the shawls im-

ported into Europe from the East have united the Cashmere patterns so intimately with these fabrics in the public mind, that it has become almost a fixed idea connected with them, and it is consequently thought indispensable to the manufacture that eastern forms and eastern treatments should be applied to these goods. Thus for a long time such works were but mere imitations, and the invention of the artist was less taxed than the laborious skill of the copyist. It is due, however, to the French designers to say, that they have of late made earnest study of the works from Cashmere and Persia, not with an intent to continue mere imitators, but to obtain the principles on which the eastern artist designed; and among those who have studied the Indian mode of ornamentation, the Messrs. Berrus (France, No. 55) must be spoken of as having greatly distinguished themselves where many are competitors.

There is nothing more difficult than to disabuse the world of a rooted error, and as the multitude, who rarely understand the true cause of excellence, have adopted the idea that the form called the *Indian pine* is the distinguishing characteristic of Cashmere patterns, this form is supposed to be necessary to the sale of shawls of this fabric, and is therefore the prominent or leading feature in all the European imitations and repetitions of these goods. But there are principles of excellence in the designs from India and the East that are the real causes of their beauty apart from any leading form, and, unless these are understood and practised, the forms alone will help but little towards the rich effects so constantly found in those works.

The Indian pine, moreover, is not present in all Cashmere shawls; in some it is either greatly suppressed or entirely absent. Whatever may have been the cause of its introduction there, whether as a sacred or national symbol, or as used only for the supposed beauty of its curves, its constant repetition in works intended for European wearers is, to say the least of it, a cause of great monotony, and implies a want of invention on the part of the designer, whose skill should supply some novel application of ornament to such fabrics to wean the public from this stock idea on the subject. But in doing this care should be taken to keep in mind those *principles* which are the true cause of the beauty of the Indian fabrics, comprising their treatment of form, treatment of colour, beauty of line, and due consideration of the material. The treatment of form is one of the essential excellences of the Cashmere designs. The objects used in ornamental decoration are always, for woven fabrics, treated quite flatly, as is the case, indeed, in all the Eastern and Indian works, whether these consist of ornamental forms having no apparent relation to natural objects, of flowers, foliage, or even of birds or animals. There is hardly any instance in which this rule has been overlooked. Moreover, excepting in the ground, large masses are rarely introduced, but large leading forms (as the Indian pine, before spoken of) are filled in with a minute diaper of smaller forms, mostly floral, and the beauty is enhanced by the graceful curves and elegant flow of these leading lines. The colours also are subject to a general rule; they consist of simple flat tints without shading, each flower, or petal, where flowers are used, each leaf in foliage, being rendered by one tint. In the best Cashmere shawls these inner diapering forms are very minute, and thus a broken texture of colour is given to the surface ornamented. The tints, where in large masses, as in some of the embroidered

ornament, have rather a tendency to secondaries; thus purple, green, and gold prevail, and the red is inclined towards the colour of the pigment called Indian red, or in some cases to pink, which is a diluted crimson (a red with blue in it): thus the general hue has rather the direction of coolness; this is particularly seen in the carpets also, both Indian and Persian, as has been before remarked. In the Cashmere woven shawls, if pure tints are used, which may be the case, these tints become broken by the mixture of colour produced by the threads of other tints coming to the surface in them in the process of weaving, thus neutralizing their force and producing the same negative tendency; invariably flat forms without perspective or imitative rendering, flat tints without shading, and single hues of the same colour, are the principles of the designer. The due consideration as well of the material as of the use to which the fabric is to be applied is evident both from the nature of the ornament, which never draws peculiar attention to itself, and from the texture, since, notwithstanding the use even of metallic threads in the ornamental design, the Indian fabrics seem never to lose the property of flowing in beautiful folds, and adapting themselves to every motion of the wearer, an excellence not so constantly present in the European manufactures. Now the French designers, to whom it seems clear that manufacturers are almost wholly indebted for their designs, although they have made much study of principles, seem either to have overlooked some, or to have willingly ignored them, either in deference to the ruling idea entertained by the public, or in order to obtain novelty; but novelty should never be sought at a sacrifice of truth. Let the designer throw away, if he pleases, the Indian forms—the Indian pine form, perhaps, the sooner the better, since it never had any symbolical significance with us, and it has long ceased to have beauty of line, tormented as it is into every possible variation from the normal form—and avoiding mere imitations endeavour after a treatment in harmony with European taste and feelings.

Thus, for instance, geometrical leading forms are sometimes used in the Cashmere shawls, and such treatment might be most successful in the hands of European artists, considering the varied and complicated combinations of flat forms open to their choice. The Byzantine tracery, guillochés, or even the graceful forms of the Renaissance, if perfect flatness were preserved, might be diapered with colour in the Indian manner; but the tide seems to have set in quite the contrary direction,—the leading forms of the Eastern patterns are kept, the just principles are disregarded: the Indian pine, exaggerated often to extreme caricature, is applied not merely to shawls but to other goods; the diaper, moreover, instead of being flat, is composed of flowers often the size of nature, imitatively and perspectively drawn, and sometimes most elaborately shaded. Thus simplicity is lost—the principle of flatness is totally disregarded—the colour not being in flat tints, and the broken *texture* of surface entirely done away with; the result has a certain showy beauty, but it is meretricious and unsound; it may be the novelty of a season, but it is built on a false foundation and will never last.

There is a circumstance connected with floral ornament which hardly seems to have had proper consideration; it deserves, however, some attention. Many of the flowers used by us as ornament are not in a state of nature, but have already been subjected to another art, the art of the horticulturist, subjected by him to a

process of cultivation which unnaturally stimulates the growth of the parts, and by means of which, the stamens being converted into petals, the flower becomes doubled and rendered artificial—more beautiful, perhaps, as a flower, but less tractable as ornament, and far less simple, far less fitted for that flat display which is required by some fabrics. By these means the five-petalled rose, the five-petalled pink, &c., become a bunch of petals; and if we would see how entirely some flowers are thus rendered artificial, the dahlia may be instanced as an example: in its simple state it has a single border of petals with a central disk,—by cultivation it is a cluster of petals, so regularly disposed as hardly to be distinguished from a rosette of ribbons made up by the milliner. Flowers in this state are already conventionalized by another art ere the designer takes them in hand, and the result is analogous to the case of the artist who copies the actions and passions of the stage instead of seeking them in their simple reality in common life. Moreover, flowers in a natural state have simple and clear characteristics which they often lose in cultivation, and it is the difficulty of duly expressing them, as artificially changed by cultivation, that seems in some degree to have led to the false manner of treating them in the ornamentation of woven or printed fabrics.

To return to the consideration of the fabrics themselves. The new mode of varying the Indian treatment above described is not so prevalent among the “designs” as it is in the fabrics exhibited, only one exhibitor of designs for shawls showing example of this extreme departure from the true style in his works. The *relaxation* of just principles is, however, seen, even in those which purport to be simply imitations of Cashmere designs; it is shown in the introduction of small landscapes on the spaces of the ground between the large leading forms; in representing in the pattern borders of ornament quilled or gathered in the manner of a fringe; and in the spaces filled up with small diaperings being imitative of foliage, palm-trees, &c., instead of being merely flat, graceful, and flowing ornamental forms. So far from endeavouring to suppress novelty, it is most desirable to encourage it as far as possible, since true novelty is not an extreme characteristic of the present time, but it must be sought by other means than those reprobated; the designer must not suppose that by exaggerating a secondary characteristic of style into undue importance, and adding new materials entirely out of harmony with it, anything really beautiful and new will be likely to result.

In the shawls exhibited this new manner is seen to be very widely spread. The greater number of those on the foreign side, both printed and woven, are thus ornamented, and Norwich and Paisley are following in the same track. One French house exhibits two woven shawls in juxtaposition, which may serve to compare the two systems. The one is an imitation Cashmere shawl, consisting of straps or bands filled in with gracefully-curved ornamental forms, powdered over with colour in the usual manner, the Indian pine being slightly visible only in the border. The other design is in the new manner; it displays very great ability and cleverness, and is most skilfully manufactured. In it the Indian pine form, exaggerated in all its peculiarities, is filled in with imitative flowers, the size of nature, naturally drawn and shaded, with such minute imitation that even insects have been depicted on their surface. The variegation of some

flowers, as tulips and asters, and the shading of others, as roses, &c., is substituted for the diapering of colour which is characteristic of the style; simplicity of tint is therefore lost, and flatness wholly abandoned; great pains and labour have evidently been bestowed on the design, yet the result contrasts unfavourably with the neighbouring Cashmere pattern, the negative colour of this last being much more satisfactory than the hot unpleasant hue of the former, arising partly from the shades containing more colour than the local hue of the flower, instead of being more negative, and more especially from the impossibility of introducing the contrasting and harmonizing tints exactly where necessary, which can so easily be done by the simpler methods of India. It is sincerely to be hoped that this false manner will be abandoned; that when imitations are intended they will be in a pure style, and when novelty is sought for it will not be attempted by thus outraging true principles.

RIBBONS.

In examining design applied to ribbons it is necessary to have especial regard to their use, and the purpose which they are intended to fulfil; for although many of the principles which have been laid down as regulating the decoration of garment fabrics are equally applicable to them, these principles are modified by the place which ribbons hold, largely partaking, as they do, of the nature of *ornaments added* to the other portions of the dress.

It may be said that, when the dress itself has much pattern, ribbons, which serve as bands marking the leading lines, or as borders, should be plain in colour and without much enrichment; their office is contrast, and either simple colours or stripes in that case are most desirable; but when the garments themselves are plain and unfigured, or figured without strong oppositions of light and dark or colour, then the ribbon may become a true contrast by its ornamentation, and require marked forms and colours to give that expression which is so requisite. When regulated by good taste, ribbons, beside giving effect to form by their contrasts, serve another important purpose, by being the means of introducing brilliant portions of pure colour complementary to the general masses of the dress, thereby, when the pervading tone of the dress is negative, giving that brilliancy and heightening which, when judicious, is a great means of enhancing its effect, and giving richness without gaudiness. This use of ribbons points out their proper ornamentation, which should be in simple forms, permitting the introduction of pure tints; these require a geometrical arrangement to give them adequate force and expression, and for this purpose the patterns of the Indian tissues offer most valuable suggestions to the ornamentist; even the introduction of gold and silver may be taken advantage of as a very suitable enrichment for these ornamenting fabrics. It is to be regretted that the great prevalence of natural floral treatments as the decoration of garment fabrics has caused the adoption of the same style in ribbons, where it is more peculiarly out of place, and that the rarest efforts of the designer and the greatest manufacturing achievements have been misapplied to overcome the difficulties this treatment induces. The design of the Coventry ribbon, for instance, apart from the style adopted, is one of great merit, more successful than the best foreign efforts in the same direction; but while it is a rare proof of difficulties attempted and successfully overcome, it is also a proof of misapplied excellence and unsuitable ornamenta-

tion, being based on the artistic principle of imitation rather than on those proper to the ornamentist, abstract beauty of form and colour.

There is an evident tendency to gaudiness and over-decoration in the greater number of these articles exhibited, and it largely arises from the above cause. The increased width these goods are now manufactured, and the wrong direction of the decoration applied to them, have greatly altered their character, and we find landscapes, figures, portraits, and all kinds of natural imitations, applied as their ornament. It is pleasant, in the face of so much that is erroneous, to notice the just taste exhibited by one manufacturer of these fabrics; the silk ribbons of Buisson, sen. (France, No. 1125), have a character entirely their own, the ornament consisting of geometrical figures in gold-coloured silk, diapered over a plain ground of some delicate tint, or borderings of geometrical ornaments on the same principle, having an analogy to the Indian patterns without imitating them, and being very appropriate for the intended use of such fabrics.

LACE.

The concluding subject of this section of garment fabrics is lace design. Lace is assimilated to certain other classes of fabrics by its uses as well as by its peculiar qualities; thus, to worked muslins, for instance, in its general lightness, and in being usually without colour either in itself or in its ornamentation; and to ribbons as being an ornamenting fabric to other parts of dress. It is one of the peculiarities of lace that it is necessarily ornamented, since, without some pattern upon its surface, it would hardly retain its name. Its characteristics of lightness and fliminess of texture should never be forgotten in its ornamentation, which should be essentially light, elegant, and flowing; all straight lines should be avoided, not only from the necessities of the manufacture, but because graceful forms are required to pervade its ornamentation. At the same time this textural lightness may lead into the opposite error, and the ornament be so flimsy as entirely to lose proper point and expression; and thus, where lace is used as a trimming, the line which it is intended to enforce or enrich be inefficiently marked from this very meagreness. The old point lace, worked with the needle, was often too heavy in character, from too equal a distribution of the masses of its ornament; it wanted less crowded spots to give value by contrast to the general surface; whereas the modern lace, from the object of the manufacturer being to cover large spaces with little work, too frequently errs in the opposite direction, and wants parts of more full enrichment to give it point and character. The border or edge, which in reality constitutes the true lace, should have the most solid and marked ornamentation, out of which should grow graceful curved forms, less marked and pronounced, gradually passing, in wide lace or in veils, &c., into diapers of sprigs or small ornamental forms over the remaining space. While the natural lines of the growth of plants may be adopted as the ornament of lace—for which they are very suitable from their elegance and variety—subjected to a symmetrical arrangement, however, in the succession of pattern, almost all imitations of flowers are to be avoided; floral forms being the rule, flowers imitated quite the exception. The petals and leaves should rarely be filled in solid, but treated with stitches of varied forms of the nature of a diaper of texture, so as to give lightness, variety, and richness at the same time.

The great excellence of the French and Belgian lace seems to consist more in the truer appreciation of beauty of line and delicacy of form, than in any very marked superiority of design over the English. In the work itself these characteristics are even more evident than in the designs, since they are most carefully and faithfully attended to and preserved. There is, moreover, a more just appreciation of *quantity* in the ornamental arrangements of the Brussels and Valenciennes laces than in our own; the patterns of Honiton lace are generally too heavy, the form rather too large and overcrowded, and the whole effect a little too solid and equal, although this partly arises from the mode of manufacture.

As compared with the important exhibition of the manufactured article, there are few "designs" for lace on the foreign side; and the best of those are more remarkable for execution than for any particular originality, viewed relatively to the beautiful fabrics themselves. On the English side there are some designs for lace curtains, and one for a lace veil, founded on Brussels patterns, by H. Heald, of Nottingham, which has merit. There are also several designs exhibited by the students of the Government School of Design, some of the most elaborate of which, by C. P. Slocombe and T. Rawlings, have been extremely well executed in Honiton lace by Mrs. Tredwin, of Exeter, and Mr. Gill, of Colyton. The designs are novel, but a little too architectural in their general arrangement, resulting in a slight degree of stiffness, and a want of that flowing ease which should characterize the ornament of the material. The female students also have some clever designs for lace. The beautiful *fabrics* exhibited will have their due share of attention from the Jury of the Class for the manufactured article. Some of the best design is to be found in the works of Groucock and Co. (Class XIX., 3), Forrest and Son (Class XIX., 45), and those already mentioned. The Nottingham lace curtains, although not to be commended for their design, show a tendency in a better direction than the Swiss worked muslins; the treatment is generally flatter, the borders better considered for quantity, and, in some of these works, a diaper over the central field has been adopted with good taste. In these goods, and in machine lace, some of the best designs are to be found in the fabrics of Heymann and Alexander (Class XIX., 25); and R. Birkin (Class XIX., 20) has one or two well-adapted designs for narrow machine lace also. On the foreign side the Belgian and French lace, from the grace and flow of the leading lines of the ornament, and the greater delicacy and refinement of the forms, together with the better appreciation of just quantity in the distribution of the parts, upholds the acknowledged superiority of their manufacture. The English lace, especially the hand-worked lace, seems rather to call attention to the labour bestowed on it as a part of the excellence; the foreign lace, even when greater labour has been employed, strikes us as rather elegant and beautiful than as laborious and costly, from the more easy and playful forms of its decoration. These qualities entirely accord with the nature of the fabric, and charm us more when, on examination, we become sensible of the curious elaboration which often accompanies them. The lace cuffs and berthes of B. Vander Kelen (Belgium, 313) include some of excellent design; and also the lace exhibited by Van Helen (Belgium, 299), B. Duhaïjon (Belgium, 314), and F. Audiat (France, 1545). On the whole there are fewer errors in the design for lace than prevail in most other manufactures, partly arising from its circumscribed nature. Besides the faults enumerated in the

foregoing remarks, the tendency to the natural imitation of flowers is seen in some of the Honiton lace.

Having passed in review the various sections and sub-sections into which this Report has been divided, it might, before concluding, be thought desirable to consider the best means of obviating the various faults observed and commented upon in the course of this examination: this, however, would be too large a subject, and one not necessarily within the nature of the Report itself. The public and the manufacturer, both equally interested, and whose improvement is equally necessary—for to be useful it must be mutual—are now awake to the necessity of better education in design; and the question naturally arises, whether the means adopted in the Government schools are the best possible for the proposed end, or whether it would be desirable to extend their scope, so as to make them not only schools of design, but in some degree workshops, where the specialties of design may be fully explained, and the due application of ornamental art to manufacture thoroughly exemplified and carried into practice?

This question, however, is twofold, and has reference to two classes, whose functions and qualifications are not necessarily identical—the designer and the art-workman. That the designer should be acquainted with certain of the means of production and the peculiar processes of the manufacture for which he designs can be doubted by no one, since, without a knowledge of the *general* conditions of the manufacture his art is to be employed upon, his labours would be useless. But the question is one of amount, and the consideration to be arrived at is, shall this knowledge be given in the course of his art-education? or is it best acquired when, having obtained a thorough knowledge of ornament, he turns his attention to some *special application* of his powers?

That the art-workman should know *all* the processes of the manufacture he is engaged upon is absolutely necessary; it is his starting point, as an education in the technicalities or processes of ornamental art is the starting point of the designer. What the art-workman has to add to his manufacturing knowledge is, such an amount of art as will enable him thoroughly to appreciate and perfectly to carry out the work of the designer, without which, indeed, he is imperfectly educated in his trade; while, on the contrary, the designer (not necessarily a workman) has to obtain such an insight into the processes of the workman or the machine as will enable him to fit his design to the difficulties of production. Like the artist and the ornamentist, the two classes, whilst generally distinct, sometimes merge into one another, from which cause the question has been unnecessarily obscured. The truth is, that while, in *some cases*, it would be most desirable that the designer should understand the *minute* specialties of the manufacture, in others it is nearly unnecessary: while the art-workman's province is quite apart from the imaginative, and all that *he* requires is a full acquaintance with the *technical means* of art, such as drawing, modelling, chasing, painting, &c. In these he cannot be too fully educated; but since the large mass of those who are to be instructed are of this class, it is obvious that the principles and practice of *design* need not necessarily form a part of the education in *all* schools of ornamental art.

This view of the question does not interfere with those *special* cases so often

alluded to in this Report, wherein, from the high requirements of the material, or of the object itself, the artist-designer is at the same time the artist-workman also, and embodies and produces his own conceptions by his own skilled handicraft.

The general truth seems to be, that when a designer has thoroughly mastered the technical language of art, and the general principles of design and its application, the amount of *special* knowledge sufficient for *his* purpose is speedily acquired in any branch of manufacture to which he may devote his attention; and in all cases more strict adaptation to uses, more originality, and greater aptness to mould the power of production to the best and most beautiful results, will arise rather from a full insight into the means at the manufacturer's command than from any technical education in those means.

This, however, is not the case with the art-workman; to give him proper instruction in *carving, chasing, embossing, painting, &c.*, it should go on consecutively with his learning the technical elements of art, and his perfection as a workman will be measured by his power of embodying his art-knowledge in his trade labours. The process, moreover, is a tedious one, requiring the hand to be educated as well as the eye and mind, to enable him successfully to combine art with handicraft; and it would seem, therefore, that such labours are essential parts of true schools of *ornamental art*.

Yet the several requirements enumerated are partial and local, and not to be made a part of general so much as of local education. Thus, since London and its vicinity is the seat, more or less, of *all* manufactures, and of the highest efforts of those manufactures, for this reason, and as a central normal school, it would be advantageous to embody in the course of the London head school instruction in all such matters; but they could only be partially useful in the provinces; as die-sinking and chasing, for instance, at Birmingham, chasing and embossing at Sheffield, modelling and painting in the Potteries, &c.; and it being ascertained which are the proper localities for central provincial schools, their peculiar art-handicraft should be taught therein, and the instruction obtained in the surrounding districts be of such a character as to prepare best for the higher instruction of the central provincial school. The truth is, that our schools have all been *accidentally* founded, rather than on any general, comprehensive, and well-defined principle: and before proceeding further, it is very desirable to have some well-arranged distribution of the means of instruction for the whole kingdom, laid down in accordance with local wants and local seats of manufacture, to control and regulate the whole, so that schools, when founded, should fall in with a pre-arranged and predetermined system. These remarks are made with no intention to dogmatise on the subject, which should rather be viewed practically than theoretically, and the solution be based on known results, rather than inferred from any supposititious points of view. The great public establishments of France, both of the Gobelins and at Sèvres, would on this account demand especial attention and consideration, since the fabrics produced therein have attained a greater excellence, both of design and manufacture, than is seen elsewhere; and it would be desirable to gain full information as to the knowledge of art obtained by the workmen, as well as of the processes of manufacture by the designers in those celebrated manufactories. In the same view, the schools founded for the instruction of the bronzists of Paris, and in which they mostly

obtain their art-education, should have a full share of attention, both on account of the reputation gained by these works for artistical completion, as well as the great fancy and invention displayed in the Parisian bronzes. While our own Mediæval Court and the clever revivals it contains will show the influence on manufacture of an educated designer acquainted with the various processes of the manufactures for which he designs, and apparently controlling both the manufacturer and his workmen in their production, we have to learn, in the former instance, whether the workmen have any, and what amount of, education in *design*, and whether their *inventive* powers have been stimulated, or only the most perfect technical acquirements obtained; on the other, we pretty well know that the workmen have obtained but little even of the technical *language* of art, and that in invention they are entirely led by the designer.

The condition of the schools at Lyons also, and their routine of instruction, would furnish much valuable information on this subject, since, in the manufacture of silk, the relations between the art and the means of execution are most intimate and complicated. They would show whether the education of the workman in art, and in many cases the exalting him into the place of the designer, has resulted in a pure and just ornamentation of the fabric, or whether it has led to the skilful appliance of manufacturing means to the production of difficulties of execution in these fabrics, rather than to the simple and the beautiful in their ornamental decoration.

In conclusion, the Reporter may be permitted to express his sincere regret at his own shortcomings. It will be evident, on the perusal of the Report, that there are many omissions, and that important subjects have been treated with great brevity. Almost entirely deprived of counsel or assistance from his fellow Jurors, this task being nearly altogether out of their jurisdiction, and only undertaken by him after the Jury labours were concluded, he has to ask for a large share of indulgence. He trusts, however, that a proper spirit of inquiry into the sources of true excellence in ornamental art may be elicited from his brief labours, and lead to the rejection of what is meretricious and false, and to a more simple, grave, and earnest style in modern ornament.

RICHARD REDGRAVE, R. A., *Reporter*.

London, November 1851.



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VAN DER VEN.

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